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—MONTHLY NUMBER.—

THE AMERICAN ARCHITECT AND BUILDING NEWS

A WEEKLY JOURNAL OF CONSTRUCTIVE AND DECORATIVE ART.

VOL. XIX.—No. 545.] SATURDAY, JUNE 5, 1886. PRICE, { REGULAR ISSUE, 15 CENTS. IMPERIAL " 25 "

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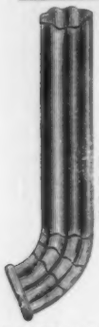

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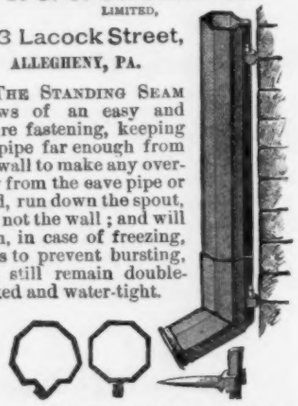

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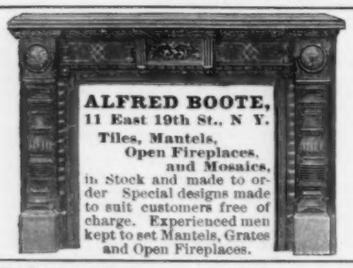

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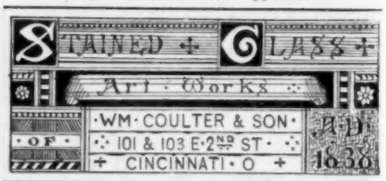

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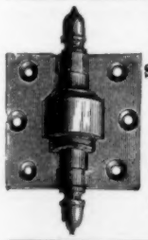

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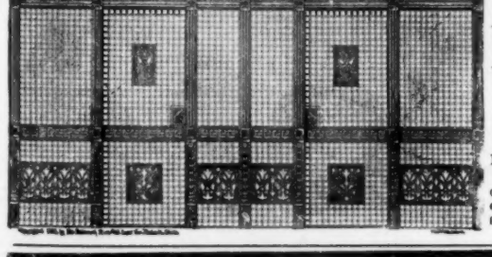

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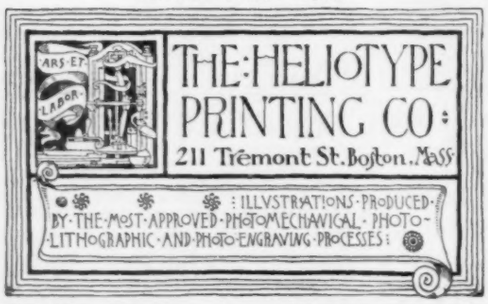

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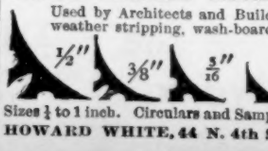

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CASH CAPITAL	**400,000.00**
Reserve and Liabilities	**1,070,610.92**
Surplus	**447,821.13**
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We desire to notify purchasers of Steam-Pumps that numerous cheap imitations of Worthington Pumps are being manufactured. It is usually represented that they are made by us or from our patterns, and being apparently close copies, they readily deceive those who are not familiar with our machines. By this method some of them have been introduced and as their construction is invariably of inferior quality the unsuspecting buyer is imposed upon and suffers correspondingly.

We therefore call special attention to the existence of these imitations and to the fact that our machinery is conspicuously marked with our trade name, the use of which by any other manufacturer is unauthorized and illegal.

HENRY R. WORTHINGTON.

BUILDING MATERIALS.

Reported for the American Architect and Building News.

BRICK.—₱ M.	New York. (Wholesale Prices.)	Boston. (Prices to Builders and Contractors.)	Chicago.	Philadelphia
Common: *Cargo afloat.*				
Pale	4 50 @ $4 75	Eastern 7 50 @ 8 00	Building Brick 9 00 @ 10 00	Sq. Hard @ 10 00
Jersey	5 50 @ 6 25	Bay State Hard 9 50		" @ 8 00
Long Island	@	Domestic Com. 9 00 @ 9 50	Indiana Pressd 16 00 @ 22 00	Salmon @ 6 00
Up River	6 75 @ 7 00	Domestic Face 19 00 @ 20 00	St. Louis Fronts @ 27 00	Sq. " @ 8 00
Haverstraw Bay	7 25 @ 7 50	Philadelphia 40 00 @ 45 00		Light Stretchers @ 10 00
" 1st	@ 7 75	Phila. mould 50 00 @ 80 00		Medium " @ 11 00
Hollow	@ 13 00			Red " @ 12 00
Fronts:			22 00 @ 29 00	Dark " @ 14 00
Croton, Brown	11 00 @ 14 00		65 00 @ 350 00	Pressed 22 00 @ 24 00
" dark	12 00 @ 15 00		@ 50 00	Best Paving @ 15 00
" red	12 00 @ 15 00		@ 45 00	Second " @ 12 00
Chicago pressed			38 00 @	Third " @ 11 00
Chicago Moulded			25 00 @	
Baltimore	37 00 @ 41 00	Glens Falls 25 00 @ 26 00	60 00 @ 100 00	
Glens Falls — white	30 00 @ 35 00	Glens Falls Mould. 30 00 @ 35 00	30 @	
Philadelphia	24 00 @ 25 00	35 00 @ 40 00	35 @	
Trenton	24 00 @ 25 00	45 00 @ 60 00	55 00 @ 65 00	
Milwaukee				
Moulded:				
Clark's Glens Falls — Red	25 00 @ 27 00		@ 100 00	Dom. @ 65
" — White	30 00 @ 35 00		@ 120 00	@ 85
White " Mold,	45 00 @ 60 00			
Enamelled: *Imp.*				
Enamelled (edge.)	85 00 @ 100 00	@		
Enamelled (edge and end)	90 00 @ 115 00	@		
CEMENT, LIME, etc.—(₱ *cask.*)				
Rosendale Cement	1 00 @ 1 10	@ 1 50	*Not Sold.*	1 15 @ 1 50
Louisville "			1 05 @ 1 30	Book, Shoobridge 2 85 @ 3 25
Utica, Akron, Buffalo, Milw'kee.	*Not sold.*	*Not sold.*	1 00 @ 1 25	2 85 @ 3 25
Portland, English (Gibbs)	2 50 @ 3 10	@ 3 00	*Not sold*	2 85 @ 3 25
" " (K. B. & S.)	2 75 @ 3 10		3 00 @ 3 25	2 85 @ 3 25
" " (Burham)	2 50 @ 2 80		2 90 @ 3 15	2 85 @ 3 25
" " (White's)	2 85 @ 3 00		3 00 @ 3 25	
" French (Lafarge)	3 50 @ 4 50	*Not sold.*	3 75 @ 4 25	Hemmoor 2 75 @ 3 00
" German (Alsen)	2 75 @ 3 15	3 00 @ 3 50	3 00 @ 3 25	2 75 @ 3 00
" " (Fewer)	2 45 @ 2 70	3 15 @ 3 35	2 80 @ 3 15	Josson 2 85 @ 3 00
" " (Vorwohler)	2 50 @ 3 25		2 80 @ 3 15	2 85 @ 3 25
" " (Lagerdofer)	2 25 @ 2 55	*Not sold.*	2 75 @ 3 00	2 85 @ 3 25
" " (Dyckerhoff)	2 75 @ 3 15	3 00 @ 3 50	3 25 @ 3 50	2 50 @ 2 75
" " (Hanover)	2 50 @ 3 00		*Not Sold.*	3 00 @ 3 50
" American (Saylor's)	2 15 @ 2 30	2 15 @ 2 50	2 75 @ 3 00	6 50 @ 7 00
Roman	2 75 @ 3 00	@ 3 20	2 75 @ 3 25	11 50 @ 12 00
Keene's coarse	5 00 @ 6 50	@ 7 50	7 00 @ 7 50	
" superfine	8 75 @ 11 00	@ 11 50	11 00 @ 12 00	
Lime:				
Lime of Tell	@ 5 00		*Not sold.*	White Lime 26 @ 30 ₱ bush.
Hydraulic Lime	@ 1 45	@ 145		White Mash 1 25 @ 150
Chicago Lime in bulk			60 @ 65	1 00 @ 1 00
Wisconsin "			75 @ 85	
Rockland and Rockport, (Com.)	@ 1 00	@ 1 15	*Not sold.*	*Not sold.*
Rockland and Rockport, finish.	@ 1 20	@ 1 20	*Not sold.*	*Not sold.*
State, com. cargo rates (nom.)	@ 90	*Not sold.*	*Not sold.*	1 25 @ 2 25
State, finishing "	@ 1 10	*Not sold.*	*Not sold.*	1 75 @ 2 70
Plaster of Paris (calcined.)	@ 1 25	1 65 @ 1 90	@ 1 75	22 @ 30
" (casting)	@ 1 45	@ 2 25	@ 1 75	30 @ 35
Hair (Cattle) ₱ *bush.*	21 @ 25	@ 30	20 @ 25	@ 1 50
" (Goat)	30 @ 35	@ 30	35 @ 40	
Sand, ₱ *load*	1 00 @ 1 25	1 00 @ 1 75	100 @ 1 25	
STONE. (₱ *cubic foot, rough.*)				
Granite: (*Maine*)		@ 60		55 @ 65
Limestone:	45 @ 1 25	95 @ 1 00		80 @ 90
Bedford	@ 1 00		50 @	
Joliet	@		35 @ 55	
Lemont	@		35 @ 60	
Serpentine			80 @ 90	4 50 ₱ Perch.

(Continued on page vi.)

BARSTOW STOVE COMPANY,

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Furnaces,

Cast and Wrought-Iron

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Send for our Illustrated Catalogue and prices of Ranges, Furnaces, etc. Also our Pamphlet, "Fireside and Kitchen, Ancient and Modern."

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	New York. (Wholesale Prices.)	Boston. (Prices to Builders and Contractors.)	Chicago.	Philadelphia.
Foundation:				
Dimension	@	5 00 ₱ ton	20 @ 28	1 45 @ 2 50
Block	@	4 60 ₱ perch	8 50 ₱ cord.	Conshocken
Rubble	@	1 25 @ 1 50	8 50 @	1 45 @ 2 50
Bluestone: (₱ *sq. ft.*)				
Sidewalk	30 @ 5 00	40 @ 1 75	75 @ 1 00	1 in.th.10 @ 19
Planed	50 @ 6 00	75	50 @ 1 00	37 @ 45
Sandstone.				
Longmeadow	@ 80	80 @ 90		1 05 @ 1 15
Kibbe	@ 90	90 @ 1 10		
Brown (Connecticut)	1 00 @	1 25 @ 1 45	1 50 ₱ cub.ft.	1 05 @ 1 35
Amherst } Ohio	90 @ 95	85 @ 95	55 @ 65	
Berea } Ohio	75 @ 1 00	80 @ 90	45 @ 55	80 @ 1 00
Berlin } Ohio	75 @ 1 00	80 @ 90	55 @ 65	
Belleville	80 @ 1 25	1 25 @ 1 35	"	1 10 @ 1 40
New Brunswick and Nova Scotia	@ 1 00	75 @ 90	"	1 00 @ 1 10
Caen	@	@ 2 00	"	1 15 @ 1 50
Marble (₱ *cu. ft.*)				
Lee, Mass	@	1 75 @ 2 50	*Not sold.*	2 00 @ 2 50
Rutland, white	@	@ 3 00	3 50 @ 5 00	2 25 @ 2 50
Sutherland Falls	1 25 @ 1 75	@ 2 00	3 50 @ 5 00	1 70 @ 3 00
Glens Falls, black	@	2 00 @ 3 00	*Not sold.*	4 00 @ 4 50
Italian, blue-veined	@	50 @ 60	@ 4 40	2 50 @ 2 75
" Sienna	@	3 00 @ 3 50	*Not sold.*	@ 5 00
Tennessee, red	@	1 25 @ 2 50	@ 4 40	4 00 @ 6 00
" Knoxville	@	85 @ 90	@ 4 40	3 00 @ 4 00
Pennsylvania, blue	@		*Not sold.*	2 00 @ 3 00
Vermont, white	@	1 50 @ 2 00	3 50 @ 5 00	2 25 @ 3 00
Slate: Roofing (₱ *square*)				
" green	7 00 @ 8 00	4 50 @ 7 00	6 25 @ 8 10	5 00 @ 7 00
" " unfading	@ 5 75	@ 5 75		5 00 @ 7 00
" purple	7 00 @ 8 50	5 50 @ 6 50		@ 11 00
" red	@ 15 00	13 00 @ 14 00	@ 8 60	@ 11 00
" black, Lehigh	— @ —	Brownville, Me.	— @ 16 00	@ 3 00
" " Chapmans	— @ —	6 50 @ 9 00	7 20 @ 7 60	@ 5 35
" Unfading Black, Monson, Me.	5 50 @ 8 00	5 50 @ 8 00	7 30 @ 8 00	@ 5 35
Tiles, Am. ₱ M	@		6 00 @ 8 50	@ 27 00
N. Peach Bottom, warranted unfading			*Not sold.*	@ 7 00
PAINTS. (*In oil,* ₱ *lb.*)				
White lead, Am	7 @ 7½	7 @ 7½	7 @ 7½	7 @ 7½
" Zinc, "	5 @ 8½	@ 8	7 @ 10½	7 @ 7½
Red lead, Am.,	5½ @ 6½	6 @ 6½	6½ @ 7	7 @ 7½
" Venetian	6 @ 10½	7 @ 12	1½ @ 2½	dry Eng. @ 1½
" Vermilion	65 @ 70	55 @ 60 dry	55 @ 60	Eng. 50 @ 60
Red Indian, Eng	12 @ 20	12 @ 20	12 @ 20	@ 9
Yellow Ochre	6 @ 15	7 @ 12	3 @ 15	dry Am. @ 1½
" Chrome	12 @ 20	18 @ 25	15 @ 25	@ 20
Green (chrome)	8 @ 13	8 @ 20	10 @ 20	@ 20
Green, Paris,	25 @ 40	25 @ 40	18 @ 35	" @ 20
Black, lamp,	15 @ 25	15 @ 25	8 @ 30	@ 16
Blue, ultramarine	12 @ 18	18 @ 30	12 @ 35	@ 20
Oil, linseed, (raw) (₱ *gal.*)	34½ @ 35	40 @ 42	40 @ 41	@ 40
" " boiled (₱ *gal.*)	43 @ 44	43 @ 45	43 @ 44	@ 43
Turpentine (₱ *gal.*)	@ 35	35 @ 38	40 @ 42	@ 40
Varnish, coach (₱ *gal.*)	@	1 50 @ 6 00	1 25 @ 2 00	@ 2 25
Shellac (₱ *gal.*)	@	2 50 @ 3 00	3 25 @ 4 00	@ 2 90
Putty (₱ *lb.*)	2 @ 3	2 @ 4	02 @ 02½	@ 2
Whiting (₱ *cwt.*)	75 @ 1 00	1 @ 1½	1 @ 1½	@ 1
Paris white, (Eng.,) (₱ *cwt.*)	1 30 @ 2 00	2 @ 3	1½ @ 2	@ 1½
Litharge, Am (₱ *cwt.*)	5½ @ 6	6½ @ 7	6½ @ 6½	@ 7
Sienna (burnt) (₱ *cwt.*)	14 @ 20	14 @ 20	4 @ 16	@ 16
Umber, " (₱ *cwt.*)	14 @ 20	14 @ 20	2 @ 10	@ 14
HARDWARE.				
Nails: (*Per Cask.*)			3 50 @	per keg @ 2 90
Spikes, (*wrought.*)	@ 2 50		@ 2 40	@ 2 30
10d. common	@ 2 35	@ 2 40	@ 3 15	2 30 @ 2 80
Shingle	@ 3 00	@ 3 15	@ 5 50	@ 5 00
Lath	@ 4 55	@ 4 65	Add $3.00	per lb 11 @ 14
(*Finishing nails according to size.*)				Add 1 00 pr cask
(*For casing nails add 75c. per keg.*)				
Butts: 4"x 4" (₱ doz. pairs.)				
Plain	@ 1 00	@ 1 20	65 @ 1 00	@ 1 16
Japanned	@ 1 50	@ 1 75	*Not sold.*	1 75 @ 2 00
Acorn, Japanned	@ 1 50	@ 2 50	2 00 @ 3 75	1 75 @ 2 00
Acorn, Boston finish (₱ pair.)	@ 65	@ 75	*Not sold.*	48 @ 50
Bronze metal	@ 1 90	plain 2 25	2 00 @ 3 25	@ 1 45
Brass (for cupboards)	@ 10	@ 10	@ 12	@ 1 00
Ebony				@ 35
Apple wood				37 @ 1 00
Knobs: (₱ *Set.*)				
Mineral, best	@ 8	@ 10	8 @ 10	@ 08
Lava	@ 50	@ 75	65 @ 80	*Not sold.*
Hematite	*Not sold*	17 @ 38	31 @ 40	25 @ 50
Porcelain	@ 30	@ 12	25 @ 30	@ 25
Glass, solid	*Not sold*	@ 75	*Not sold.*	1 75 @ 2 00
Glass, silvered	*Not sold*	88 @ 1 50	@ 1 50	1 75 @ 2 00
Bronze metal	75 @ 2 00	88 @ 2 00	75 @ 2 50	50 @ 3 50
Brass	1 00 @ 2 50	88 @ 2 00	1 50 @ 3 00	50 @ 3 50
Solder:		16 00 @ 17 00	13 00 @ 15 %	22 @ 35
Iron:				
I-Beams up to 12"	@ 3	@ 3	@ 4	base @ 3
I-Beams above 12"	@ 3	@ 3	@ 4	@ 3
Channel-Beams up to 12"	@ 3	@ 3	@ 4	

(*Continued on page* vii.)

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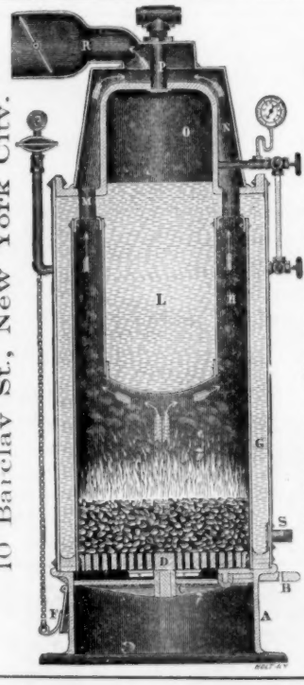

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THE NOVELTY HOT-AIR FURNACE
for that purpose. It has been in use thirteen years, set by all grades of workmen, giving much more than general satisfaction. You are often forced by circumstances to locate the Heat and Flues against your judgment. Then a first-class and powerful Furnace is absolutely essential. The "Novelty" is no ordinary candidate for your favor under such circumstances. It exposes an immense radiating surface by its peculiar and excellent arrangement, enabling it to supply constantly a
LARGE VOLUME OF PURE WARM AIR.
This, of course, is the primary requisite, but the "Novelty" is also constructed on the principles of science and broad common sense, endowing it with lasting power under the public's test, that are of
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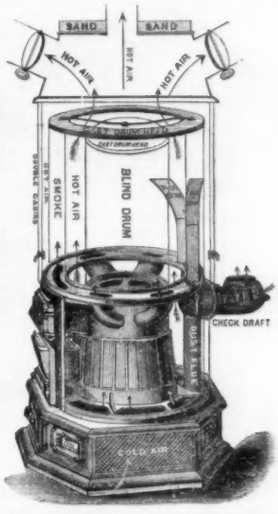
The Common Sense has also provided every convenience for easy management and perfect control, so that servants run them successfully, affording the owner much satisfaction and comfort by developing in full their
IMMENSE HEATING POWER.
This is the season to see them in use. Note the results and make comparison. We will be glad to send you a Descriptive Pamphlet containing references.



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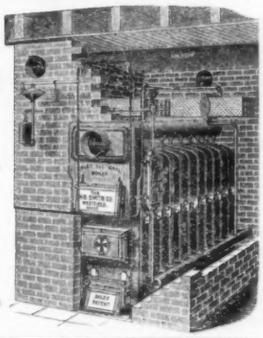

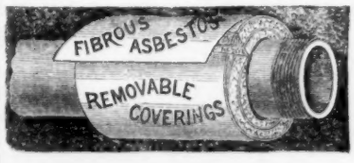

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Boards: (*Ordinary dimensions.*)				
Pine, 1st quality, clear	65 00 @ 75 00	50 00 @ 60 00	46 00 @ 48 00	55 00 @ 60 00
" 2d quality	55 00 @ 60 00	42 00 @ 48 00	44 00 @ 46 00	40 00 @ 50 50
" 3d quality	18 00 @ 22 00	35 00 @ 40 00	43 00 @ 45 00	15 00 @ 30 00
Spruce	@ 25 00	13 00 @ 15 00	*Not sold.*	@ 35 00
Hemlock	ea. 17 @ 18	12 00 @ 13 00	@ 10 00	@ 14 00
Yellow pine	20 @ 40	25 00 @ 40 00	@ 28 00	20 00 @ 50 00
Cypress	@	32 00 @ 40 00	@	40 00 @ 45 00
Clapboards:				
Pine	@	33 00 @ 55 00	10 50 @ 22 00	20 00 @ 35 00
Spruce	@	23 00 @ 35 00	*Not sold.*	*Not Sold.*
Framing Timber:				
Pine			12 00 @ 17 00	28 00 @ 32 50
Spruce	13 50 @ 16 00	14 00 @ 16 00	*Not sold.*	20 00 @ 22 50
Hemlock	12 00 @ 15 00	@	10 50 @ 15 50	12 50 @ 13 50
Yellow pine	18 00 @ 25 00	23 00 @ 30 00		26 00 @ 28 00
Laths:				
Pine	@	2 25 @ 2 35	1 75 @	@ 3 00
Spruce	2 25 @ 2 40	2 25 @ 2 50	*Not sold.*	@ 2 75
Shingles:				
Pine, shaved ₱ M	5 00 @ 6 00	@	*Not sold.*	
Pine, sawed "	4 00 @ 5 00	@ 4 50	2 40 @ 2 60	
Spruce, sawed "	1 50 @ 2 00	1 50 @ 2 00	*Not sold.*	
Redwood ₱ 125	1 40 @ 1 60	3 75 @ 4 50	5 50 @ 8 00	30" $10 @ 28
Cedar, split ₱ M	@	@	*Not sold.*	24" 8 @ 21
Cedar, sawed "	@	2 00 @ 4 00	2 25 @ 2 35	20" 5 50 @ 14
Cypress. Split....7 x 24. "	18 00 @ 20 00	5 50 @ 6 00	4 00 @ 4 50	13 00 @ 20 00
Miscellaneous:				
Piles ₱ ft.	4½ @ 5½	Piles 6c. ₱ ft.	*Not sold.*	
Fence pickets, Spruce	8 00 @ 10 00	10 00 @ 18 00	Pine, 8 @ 21 00	12 00 @ 14 00
Cedar posts, 9 ft. (sq. posts.)	@	25 @ 35	9 00 @ 21 00	70 @ 1 25
Chestnut "	@	25 @ 35	*Not sold.*	28 @ 36
Finishing Woods: ₱ M. (*First Qual.*				
Ash [*Kiln-dried.*]	@ 55 00	38 00 @ 50 00	35 00 @ 40 00	35 00 @ 50 00
Cherry	80 00 @ 120 00	60 00 @ 100 00	80 00 @ 100 00	75 00 @ 120 00
Chestnut	@ 55 00	38 00 @ 50 00	45 00 @ 50 00	40 00 @ 50 00
Butternut	40 00 @ 60 00	60 00 @ 70 00	50 00 @ 60 00	67 50 @ 75 00
Mahogany, Baywood [Mexican]	@ 180 00	150 00 @ 160 00	150 00 @ 180 00	150 00 @ 250 00
" St. Domingo	@ 350 00	120 00 @ 350 00	250 00 @ 300 00	200 00 @ 300 00
Maple	45 00 @ 50 00	45 00 @ 60 00	25 00 @ 35 00	27 50 @ 55 00
Oak, red	@ 70 00	@ 50 00	30 00 @ 40 00	35 00 @ 45 00
" white	@ 70 00	50 00 @ 55 00	35 00 @ 40 00	40 50 @ 50 00
" quartered	@ 90 00	65 00 @ 70 00	40 00 @ 50 00	57 50 @ 67 50
Sycamore quartered		50 00 @ 65 00	40 00 @ 50 00	57 50 @ 67 50
Pine, clear	65 00 @ 70 00	30 00 @ 65 00	45 00 @ 50 00	@ 65 00
Redwood	60 00 @ 70 00	60 00 @ 70 00	60 00 @ 65 00	72 50 @ 75 00
Rosewood ₱ lb	@ 6		@ 7	
Walnut, black	125 00 @ 150 00	85 00 @ 120 00	80 00 @ 100 00	90 00 @ 200 00
Whitewood	45 00 @ 50 00	38 00 @ 45 00	30 00 @ 35 00	25 00 @ 45 00
Yellow pine ₱ M	@ 45 00	40 00 @ 45 00	30 00 @ 35 00	37 50 @ 45 00
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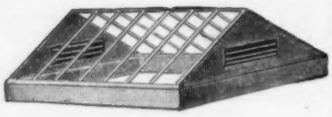

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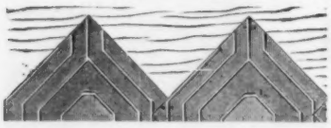

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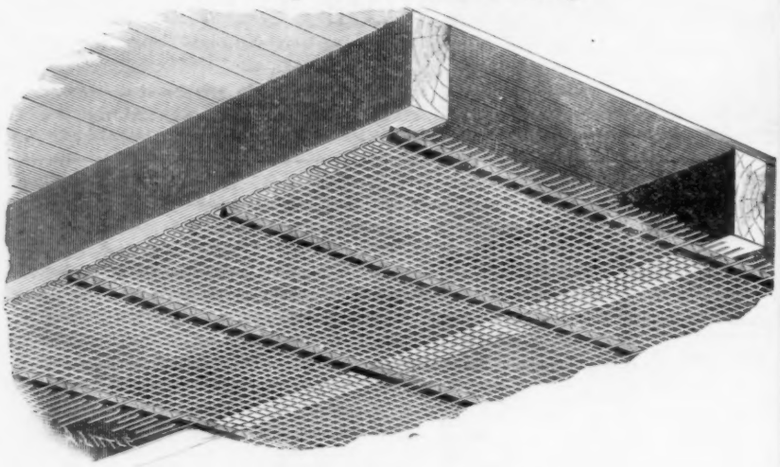

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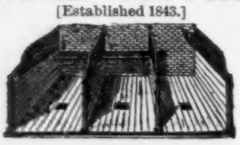

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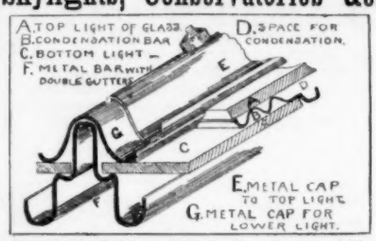
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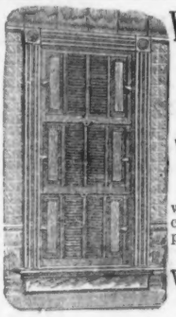

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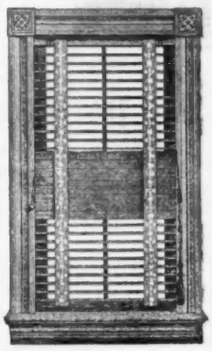

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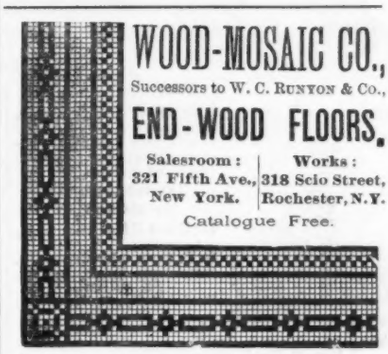

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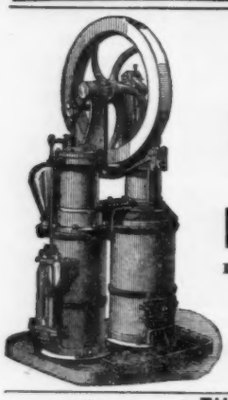

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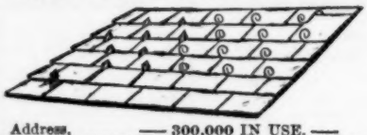

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WE suppose that the familiar and epigrammatic epitaph devised to perpetuate the fame of Sir Christopher Wren will recur to every one when he learns that the Boston Society of Architects is taking steps to secure the erection in Trinity Church, Boston, of a monument of a kind which shall fittingly do honor to the memory of the late Mr. Richardson. It is not yet determined what form shall be given to the memorial, but as the Society seeks to raise the sum of five thousand dollars in contributions from the architects and architectural societies throughout the country, we may expect that something will be done as worthy of the man as is the statue of George Edmund Street which was so short a time ago unveiled at the New Law Courts, London. Some have suggested that as the church was its architect's best monument, the proper thing was to aid in the completion of that structure, the west front of which still lacks the fine porch and other features which Mr. Richardson had lately designed; but as it appeared that Trinity Society was amply able to finish its own building, and is understood to be about to do so, this suggestion was abandoned, and the memorial will take a form more easily identified with its intention. We hope that the members of the profession will respond to the invitation freely, and forward their contributions, however modest, to the Treasurer of the Society, Mr. W. G. Preston, 186 Devonshire Street, Boston, or to any member of the following-named committee: Messrs. E. C. Cabot, R. S. Peabody, A. Rotch, R. D. Andrews, and E. M. Wheelwright. There is one point of some delicacy which must not be lost sight of in erecting such a memorial in such a place, and that is that though the building is always credited, and probably with perfect propriety, to Mr. Richardson, yet it was strictly the work of the firm Gambrell & Richardson, and we feel that Mr. Gambrell's advice and aid during the designing and construction of the building must have been such that this fact should be recognized in any memorial that may be erected in the building, that is, if the memorial is to associate the architect it commemorates with the building in which it is placed.

AS the question whether it is worth while for a woman to undertake to become a practising architect is one of general interest, we prefer to consider it here rather than give a specific opinion on the special case that has been referred to us, though this has some unusual features; for instance, the young woman was some time ago dissuaded from beginning her studies by the statement that the practice of architecture was arduous, and required a knowledge of, to her, unsuspected branches of science. Accordingly she was led to abandon her desire, and devote herself to the study of industrial and ornamental design, but the lapse of time has only served to convince her that her true vocation is to become an architect, if the limitations imposed by her sex, and the prohibitions of convention will permit. Apparently it is *une femme sérieuse* who seeks our advice, and in all soberness we counsel her to follow her bent, if, after having ascertained fully what things an architect must know and what bodily strain he has to endure, she still thinks herself fitted to enroll herself—a woman can sign herself an architect in this free country with as good right and title as any male house-milliner of us all—in the ranks of the profession. We hint at the limitations of physical strength only, as it is too late a day for any one to question the mental capacity of woman, in exceptional cases at least. We will only limit our recommendation by expressing the opinion that there are few women who can become, in the fullest sense of the word, *practising* architects as the word is understood by male practitioners, for the simple reason that they could not endure the strain. This can be in a manner proved by examining with some attention the architects of one's acquaintance, the chances being that the majority of them will be found to be men who have evidently found it impossible to keep themselves in good physical condition, and are evidently now working on such nerve force as is left to them, and then considering what would be the condition of the same number of female architects who would have begun their career already abundantly conscious of those nerves which the male architect only discovers after some years of the wear and tear of practice.

THE architects' ordinary work is unquestionably arduous, owing partly to its peculiarly complex nature, for it demands mental effort as exacting as that which falls to the engineer, imaginative effort such as is exercised by artists and designers of all kinds, the prevision of the thorough sanitarian — we hold that the architect and not the physician should be the real sanitarian — and the address of the accomplished man of affairs; to these must be added the capacity to endure the indoor confinement and physical strain that fall to the lot of draughtsmen of all kinds. But as there are few men who satisfy these requirements as they should be satisfied, and as, consequently, there are few architects in the fullest sense of the word, while there are many who are accepted as such though lacking in some of these particulars, so there is no reason why a woman should not perform some of the architect's duties as acceptably as most men, if she take care, as men, usually do, to supplement her own abilities by taking to herself a partner who is strong in those branches in which she knows herself to be weak. We know there are already a few women in this country who are practising architects, though we know nothing of the character of their work, or the amount of success they have achieved. It seems to us, however, that if woman is to gain a footing in the profession it will be necessary for the pioneers to be endowed with a higher degree of capacity than need be possessed by their successors, or by men who enter the profession at the same time with them, for it is by their prowess that the mandates of convention and the prejudice of centuries are to be overcome. To women of mediocre power and slight individuality we would say, wait till your more — shall we say—masculine sisters have prepared the way, if you expect to earn a livelihood.

BUT short of a full performance of an architect's duties there are possibilities of a woman's satisfactorily discharging enough of them to make it worth while for her to enter on a course of study. There are so many examples of women who have mastered mathematics and physics that there is no reason why women should not become good constructors and of value as such in any office. The increase of female physicians and the success they meet with certainly indicate that women may become able sanitarians. Women again, who are the founders and managers of large and successful businesses are common enough in any quarter of the world to indicate that they are capable of becoming competent advisers of and agents for the clients who may entrust them with commissions. But the field of design, particularly the designing of houses — the

peculiar stronghold of womankind, and interior decoration seem to promise women the best chance of exercising any architectural talent with which nature may have endowed them. In spite of all this we believe that architects who have had female assistants in their offices have found them, as a rule, unsatisfactory, because of a certain lack of conscience and fidelity growing out of an inability to appreciate the importance of little things and being at all times thorough; and we are so unfortunate as to believe that this peculiarity is so general a characteristic of the sex that it will require the efforts of consecutive generations of women before the world will believe that, other things being equal, it is as wordly wise to employ a woman as a man. The architectural departments of Cornell University and the Illinois Industrial University are open to women, and give diplomas in course, and the lectures at the Massachusetts Institute of Technology are also open to them, so there is certainly the opportunity to acquire the requisite training.

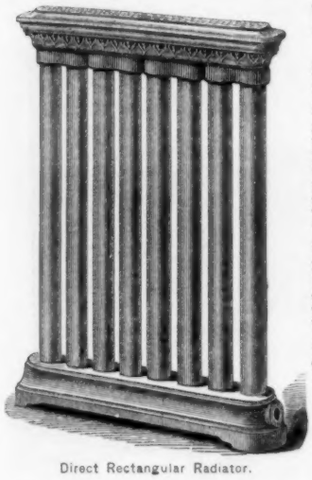
SELDOM has the old adage "out of sight out of mind" been proved a true one more disastrously — in a small way — than in the case of our competition for designs for a five-thousand-dollar house. It will be remembered that we undertook to have an estimate made by a trustworthy Boston builder for each design submitted, so that all designs might be measured by a common standard. Accordingly, we placed the fifty-one designs in the hands of a builder who, we knew, was in the habit of actually "figuring" his bids, and offered in payment the largest sum that we could afford. The builder took the drawings with the explicit understanding that he would figure on two or three of them at once, and if he so found that it would take more time than he could afford to spend he would return all to us immediately. As the drawings were not returned in a few days, we imagined that everything was in proper train, and conscious that estimates on fifty-one imaginary jobs were not to be expected at once we dismissed the matter — too effectually — from our minds. At length the matter occurred to us again, and we wrote to have the drawings and estimates sent in, when, to our chagrin and to the weakening of our faith in human nature, we at once received the drawings, but never a scrap of "figuring" or a word of explanation. Feeling that we were only too likely to be as unsuccessful with any other builder we might apply to, and that we had already kept the competitors in suspense longer than was proper, we have placed the drawings in the hands of the jury, and propose to publish them as soon as the award is made — unless we receive, meanwhile, so large a percentage of protests against abandoning the execution of our own suggestion as shall cause us to make another attempt to secure the desired estimates.

WHERE seems to be a stirring of public opinion in Philadelphia just now towards securing one or more good hotels for that town. Everybody knows that they are sorely needed. The *Times* of recent date expresses the opinion that such a growth of business prosperity as Philadelphia has witnessed calls for and ought to insure a corresponding growth in hotel building. It thinks that there must soon be erected, within the territory bounded by Arch, Walnut, Thirteenth and Sixteenth Streets, two or three of the finest hotels in the country — buildings which shall be a credit to the city as well as a source of satisfaction to the residents and the travelling public. This may be so; but if the prediction is to come true, and if the Quaker City really desire to take a leading position in the matter and manner of hotels, she should take care that the external appearance of the new structures is in keeping with the elegance and completeness of their interiors. Take the hotels throughout the country, great and small, and how unattractive they are architecturally! The large structures, especially those that have sprung up almost in a day and a night, at the seashore and mountain resorts, are perhaps less pleasing to the æsthetic taste than those smaller and less pretentious. Nearly every city of size can show in its hotels a large measure of interior arrangements for comfort and pleasure, but the outside walls have been run up too often, with little regard for beauty or grace. They are mainly shells, so designed as to cover the requisite amount of space and afford the necessary number of rooms, leaving the idea of exterior charm wholly secondary, if indeed it enters into the plan at all. Look, for example, at one of the largest hotels in the country, one of the Saratoga group, and who can find any architectural beauty in it? There are some indications of a change in Boston hotel architecture: some of the apartment-hotels, more recently erected, are in the line of progress, and from descriptions of hotels for general use soon to be built, it appears that they are to be complete, outside as well as inside, and such as will be no discredit to modern architecture. We make our churches, our great public buildings, our smaller town-halls and our business places, as well as our private residences, beautiful. Is there any good reason why hotels should not be as attractive as stores, for instance? Why should not capitalists who put their money into hotel building seek to make them appeal to the eye of the traveller, as well as to his stomach? Will they always rely upon the excellence of interior appointments and good fare to attract patronage? Shall I not take more of "mine ease in mine own inn," if I am made to feel that it is good without as well as within? And will it not soon be found a good business investment to have the work of first-class architects upon the outside of hotels, with the understanding that the architects shall consider artistic exteriors one of the requirements in their work?

A RATHER interesting point was recently decided by the Massachusetts Supreme Court, on appeal from the court below. A furnace manufacturer placed two furnaces in a house under a stipulation which is becoming rather common in certain kinds of business, that they should remain the property of the dealer until paid for. The owner of the house in which the furnaces were set sold the house to a Mr. Way, without mentioning the fact that the furnaces did not belong to him, and the furnace-man brought suit against the new owner to recover either the furnaces, with the pipes and registers connected with them, or their value. The lower court ordered judgment for the defendant, on the ground that the furnaces were a part of the house, and passed with it to an innocent purchaser without regard to an argreement respecting them of which he was ignorant. The furnace-maker appealed, claiming that Mr. Way might have found out by inquiry that the furnaces did not belong to the former owner of the house, and that as he neglected to make any inquiries on the subject he was legally "affected with notice" of the fact which he might have learned. The full bench of the Supreme Court was called upon to consider the question, and decided that it "could not properly rule" that as the defendant made no inquiries he was affected with notice of what he might have found on inquiry, that the furnaces were the property of the plaintiff; and it further decided that it was "quite clear" that the furnaces and pipes claimed in the plaintiff's writ, which were put in as part of the house, and were essential to the enjoyment and use of them as dwelling-houses, were "annexed to and became a part of the realty, and passed to the defendant by his deed." The fact that there was an agreement between the former owner and the plaintiff that the furnaces should remain the property of the plaintiff until paid for was "immaterial unless the defendant had notice of such agreement, and notwithstanding such agreement the property annexed to the realty would pass to an innocent purchaser without notice.

THE *Sanitary Plumber* quotes from the Pittsburgh *Iron Review* an account of some experiments in regard to the comparative rapidity of transmission of heat through cast and wrought iron, which were made at the request of the Franklin Institute of Philadelphia, by a Pittsburgh iron manufacturer. The experiments made were very simple and resulted in showing that average cast-iron transmits heat more rapidly, by about ten per cent, than wrought iron of the same thickness. According to the experiments the laminated structure of wrought iron seems to check the passage of heat through it, and this appears not at all improbable. In fact, it has been asserted, perhaps as the result of observation, that steam radiators made of wrought-iron pipe purposely rolled very thin are considerably more efficient than those of pipe of the ordinary thickness, by reason, apparently, of the readier passage of heat through the thinner pipes; while it is usually thought, in using cast-iron pipes for hot-water radiation, as is the common way, that the thickness of the metal has no appreciable effect on the rapidity of transmission of heat through them. Whether any experiments have been tried to determine the comparative efficiency of wrought and cast steam radiators we do not know, but the result of such experiments would be both interesting and important to architects.

NOTES AND DATA ON RADIATORS, HOT-AIR PIPES AND REGISTERS FOR STEAM HEATING.—I.



Direct Rectangular Radiator.

THIS article has been prepared for the purpose of putting into practical form for the use of architects and those who have to do with steam-heating plants, such reliable information as the writer has been able to obtain from trustworthy works and experiments on the subject, and from his own experience and observation of the working of the steam-heating apparatus in many of the public buildings of Boston. The writer believes he has presented here nothing that may not safely be relied upon, but should this article call forth intelligent criticism he will feel that it has accomplished a two-fold object.

DEFINITIONS AND FUNDAMENTAL DATA. — CLASSES OF RADIATION.

Heating surfaces are divided into three classes; those affording: 1. Direct radiation. 2. Indirect radiation. 3. Direct-indirect radiation.

Direct Radiating Surfaces embrace all heaters placed within a room or building to warm the air already in the room.

Indirect Radiating Surfaces embrace all heating-surfaces placed outside the rooms to be heated, and should only be used in connection with some system of ventilation.

There are two distinct modes of indirect radiation, one where all the heating-surface is placed in a chamber and the warmed air distributed through air-ducts and impelled by a fan in the inlet or cold-air duct. The other, where the heating-surface is divided into many parts and placed near the lower ends of vertical flues leading to the rooms to be heated. The first mode has not, as a rule, proved a great success, although there are buildings that have been successfully heated in this way. The latter mode is the one most used, and if properly arranged is sure to prove a success.

Direct-Indirect Radiation is a mean between the other two methods. The radiators are placed in the rooms to be heated, as in the first method, to which a supply of fresh air is admitted from outside the building by means of registers placed back of the radiator. When the radiators are placed against an outside wall, and a casing is put around the back and top to force the air against the radiator, and an outlet is provided for the vitiated air, this method of heating will be found very satisfactory, and at the same time economical.

Measure of Heat.— The unit of heat (aside from that given by the thermometer) is known as the *thermal unit*, and, in Great Britain and in this country, is the amount of heat required to raise the temperature of one pound of water one degree Fahrenheit.

Specific Heat.— To heat a pound of air at constant pressure one degree will require only 0.2377 as much heat as would be necessary to heat a pound of water one degree, or the specific heat of air is 0.2377.

A cubic foot of dry air at atmospheric pressure and at 60° Fahrenheit weighs 0.0764 pounds, hence, to raise one cubic foot of air at 60° one degree will require $0.0764 \times 0.2377 = .01816$ units of heat.

The condensation of a pound of steam to water gives out 966 thermal units. Hence, to determine the amount of heat given out by any radiator in a given time, it is only necessary to determine the amount of water in pounds which the radiator condenses in the same time and multiplying it by 966. With an ordinary boiler, properly set and with adequate draught and suitable proportions of heating-surface, one pound of anthracite coal of average quality will give out 9000 units of heat to the steam generated.

HEATING BY DIRECT RADIATION.

For warming rooms used for offices, stores, workshops, mills and places which are occupied by only a few people, or which may be ventilated by opening the windows, direct radiation affords a cheap and convenient mode of heating.

For rooms in which it is desirable that the heating apparatus shall present a neat appearance, and occupy as little space as possible, some form of upright radiator is generally employed. The most usual form is the pipe-radiator, of which a small one is shown in the inital cut.

These radiators are formed of a number of short, upright, one-inch tubes, from 2 feet 8 inches to 2 feet 10 inches long, screwed into a hollow, cast-iron base or box, and are either connected together in pairs by return bends at their upper ends, or else each tube stands singly with its upper end closed, and having a hoop-iron partition extending up inside it from the bottom to nearly the top. Of late years various forms of cast-iron radiators have been introduced for heating by direct radiation.

Figure 2 shows one of these patterns, known as the Bundy Radiator, manufactured by the A. A. Griffing Iron Company, of Jersey City. These radiators are extensively used throughout the United

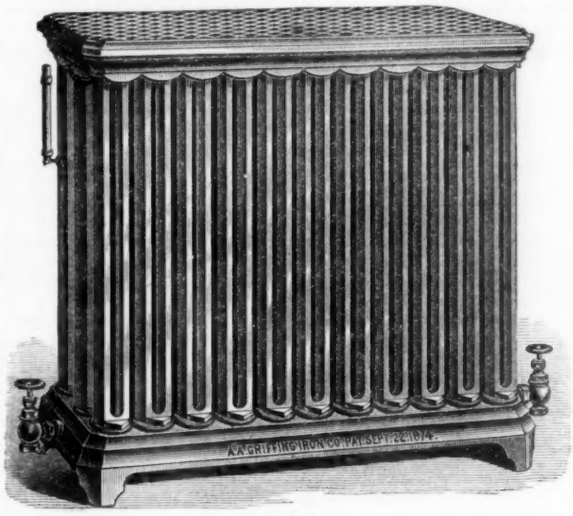


Fig. 2. Three-Row Bundy Radiator.

States, more especially in New York. The Walker & Pratt Manufacturing Company also manufacture a very similar radiator.

Figure 3 shows a form of extended-surface cast-iron radiator, manufactured by Ingalls & Kendriken, of Boston, which is largely in use in Massachusetts. Each manufacturer claims special advantages for the particular form of radiator which he manufactures. The pipe radiator seems to find as much favor as any, although it occupies more space for a given amount of heating-surface.

Regarding the *location of the radiators* in a room, it is generally recommended that they be placed against the outside-wall of the room, and preferably before or under the windows, if they can be so located without being in the way. For waiting-rooms in depots and stations, circular radiators placed in the centre of the room, and covered with a marble slab, are the most desirable. Where there are columns in the room, the radiator can be placed around one of them, and thus afford all the advantages of a radiator in the centre of the room, and without occupying valuable space.

Computation for the requisite amount of Heating Surface. — All radiators are measured by their heating-surface, or the amount of surface of the pipes which come in contact with the air. Therefore,

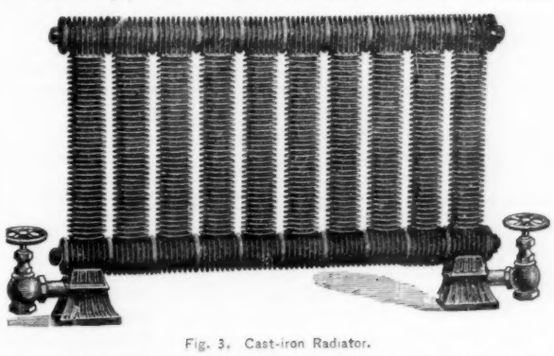


Fig. 3. Cast-iron Radiator.

to determine the size of radiators required to heat any given room it is necessary to determine the heating-surface, and divide this up among as many radiators as may be thought desirable.

The common practice is to allow one square foot of direct-radiating surface to a certain number of cubic feet of space to be warmed.

The following is the proportion of heating-surface for different classes of rooms, recommended by the engineer of the Walworth Manufacturing Company: —

For dwellings, cold or exposed rooms,	1	foot heating-surface to	50	cubic feet.
" ordinary rooms	1	" "	65 or 70	"
" warm, sunny rooms	1	" "	80	"
For churches and audience rooms	1	" "	120 to 150	"
For factories and work-shops	1	" "	200	"
For wholesale stores and warehouses	1	" "	200	"

In deciding upon the proportion of radiating-surface to the cubic contents it should also be remembered that city houses require less heat than those in the country, and brick houses less than wood.

Mr. William J. Baldwin, in his excellent work on "*Steam Heating for Buildings*" gives the following rule for computing the direct radiating surface for keeping a room at the temperature of 70° with the temperature outside at zero: —

Rule.— Multiply the superficial area of the wall (including the windows), in square feet, by the number opposite the substance in Table I, and divide by 1000 (the value of glass). The product is

the equivalent of so many square feet of glass in cooling power. Divide the equivalent glass area by 2, and the result will be the square feet of radiating-surface required in a well-built building.

TABLE I.

SHOWING THE POWER OF TRANSMITTING HEAT OF VARIOUS BUILDING SUBSTANCES COMPARED WITH GLASS.

(*Baldwin's "Steam-Heating for Buildings."*)

Window-glass	1,000
Oak and walnut	66
White pine	80
Pitch pine	100
Lath and plaster	75 to 100
Common brick (rough)	120 to 130
" (whitewashed)	125
Granite or slate	150
Sheet-iron	1030 to 1110

Example.—How many square feet of direct radiating surface should be placed in an office 15 feet by 20 feet, 12 feet high, with two windows, having 20 sq. ft. of glass each, and one pine door having 22 square feet.

Ans. — Cubic contents of room, $15 \times 20 \times 12 = 3600$ cubic feet; divide by 70, and we have 52 square feet. Or by Mr. Baldwin's rule: entire wall area equals $70 \times 12 = 840$ square feet. Take out glass and door surface, and we have: —

Lath and plaster,	77 square feet	× 75 =	58,350
Glass	40 " "	× 1000 =	40,000
Pine	22 " "	× 80 =	1,760
			100,110

Divide by 1,000 and then by 2, and we have 50 square feet for the heating surface.

Table II gives the number of tubes, heating-surface and dimensions of the regular patterns of pipe-radiator made by the Walworth Manufacturing Company, of Boston, Mass.

TABLE II.

RECTANGULAR PIPE RADIATORS THIRTY-FIVE INCHES HIGH.

ONE ROW OF TUBES.

No. of Tubes.	Surface. sq ft.	Length. ft.	Length. in.	Width. in.	No. of Tubes.	Surface. sq. ft.	Length. ft.	Length. in.	Width. in.
4	4		10½	4½	20	20	3	6½	4½
6	6	1	2½	"	24	24	4	2½	"
8	8	1	6½	"	28	28	4	10½	"
10	10	1	10½	"	32	32	5	6½	"
12	12	2	2½	"	38	38	6	6½	"
16	16	2	10½	"					

TWO ROWS OF TUBES.

8	8		10½	6½	36	36	3	2½	6½
12	12	1	2½	"	40	40	3	6½	"
16	16	1	6½	"	48	48	4	2½	"
20	20	1	10½	"	56	56	4	10½	"
24	24	2	2½	"	64	64	5	6½	"
28	28	2	6½	"	76	76	6	6½	"
32	32	2	10½	"					

THREE ROWS OF TUBES.

12	12		10½	8½	60	60	3	6½	8½
18	18	1	2½	"	72	72	4	2½	"
24	24	1	6½	"	84	84	4	10½	"
36	36	2	2½	"	96	96	5	6½	"
48	48	2	10½	"	114	114	6	6½	"

FOUR ROWS OF TUBES.

16	16		10½	10	80	80	3	6½	10
32	32	1	6½	"	96	96	4	2½	"
48	48	2	2½	"	112	112	4	10½	"
64	64	2	10½	"	128	128	5	6½	"

CIRCULAR.

Heating surface.	Diameter. ft.	Diameter. in.	In halves to surround columns. Heating surface.	Diameter. ft.	Diameter. in.
18	1	1⅜			
30	1	6½			
54	1	11½	56	2	2¼
72	2	2½	80	2	4½
102	2	10½	102	2	9½
130	3	2	130	3	2
160	3	2	160	3	2

When the appearance of a common radiator in a room is an objection, it can be cased by iron covers, so as to make it less unattractive in appearance. Figures 4 and 5 represent two patterns made by the A. A. Griffing Iron Co.

DIRECT-INDIRECT RADIATION.

The only difference between this method of heating and the direct method is that the radiators are directly supplied with fresh air, either by a register placed in the outside wall, or by means of a duct leading from the exterior air to the radiator. When this method is used, a hood should be placed against the back and over the top of the radiator, to force the air against the radiator, and then into the room. Ducts should also be provided to carry off the foul and heated air of the room. It is evident that fresh air cannot enter a room faster than the impure air leaves it.

In computing the heating-surface for direct-indirect radiation, about one-half more surface is allowed than for direct radiation.

INDIRECT RADIATION.

This is undoubtedly the best method of heating by steam, and at the same time the most expensive, although it is not so expensive but that it should be used for all schools, hospitals, audience-rooms, and any room occupied by a large number of people for any length of time. The principal rooms in dwellings should be heated by the indirect system when steam heat is employed. It is impossible to heat a room by this method without having some ventilation, as the fresh hot air coming into the room must by necessity force out the impure air. The best and most common method of arranging the heating apparatus for this method of heating is to locate the radiators in the basement, enclose them in galvanized-iron boxes, or wooden boxes

Fig. 4.

Fig. 5.

Radiator-Screens.

lined with tin, and connecting the boxes with registers, placed in the rooms to be heated, by round pipes either of tin or galvanized-iron. The radiators are supplied with pure air by pipes connecting the boxes enclosing them with the external atmosphere.

To secure satisfactory heating at each register it is essential that there should be a separate stack of radiators for each register; if two or more registers are supplied from one stack, the cold and wind may cause all the heat to go to one register, and none to the others.

The Radiators.—For indirect radiation, a form of radiator is employed different from those used for direct heating. In this method it is desirable to have as many feet of heating-surface in as little space as possible, and many different patterns have been devised for this purpose. The earliest form used, and which is still used to a great extent is the pipe-coil radiator, in which a coil of pipes connected at the ends with return bends, is used for the radiator. This gives a much larger surface for the same space than the vertical-pipe radiator, and can be easily made by any steam-fitter.

Fig. 6. Indirect Pipe Radiator.

Figure 6 represents an improved form of indirect pipe radiator made by the Walworth Manufacturing Company. The regular sizes of this radiator are as follows: —

No. of Tubes.	Square feet.	Length of base. ft.	Length of base. in.	Width of base. inches.
4 × 4	16		9½	7⅜
4 × 6	24	1	1½	"
4 × 8	32	1	5½	"
4 × 10	40	1	9½	"
4 × 12	48	2	1½	"
4 × 16	64	2	9½	"
4 × 20	80	3	5½	"
4 × 24	96	4	1½	"
4 × 28	112	4	9½	"

Figure 7 represents six sections of Gold's pin indirect radiator, manufactured by the H. B. Smith Co., Westfield, Mass. This is a

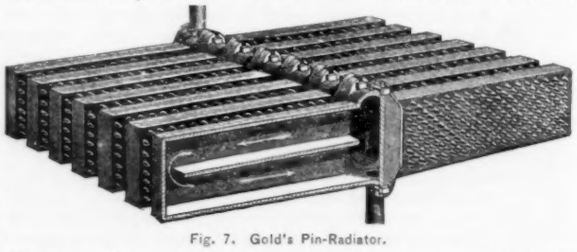


Fig. 7. Gold's Pin-Radiator.

cast-iron radiator, which is very extensively used throughout the country. As there is now no patent on this radiator, it is manufactured by many different companies.

The radiator as made by the H. B. Smith Co. is made in sections of nominally 10 square feet of heating-surface to a section, but actually 8.37 square feet. Each section is 6½ inches high, 41 inches long, and 3 inches wide, and contains 912 pins, each pin having a base of one-half inch, a top of one-fourth inch, and a length of eleven-sixteenths inches, the pins being in staggered rows, as shown in Figure 7.

To find the floor-space for any number of sections, allow three inches for the width of each section, plus one-half inch for each outside section, and the thickness of the box twice.

Figure 8 represents six sections of Clogston's patent cast-iron indirect radiator, manufactured by Ingalls & Kendricken, of Boston. Similar forms of radiators are used by other firms. This particular pattern is made in sections 42 inches long, 8 inches high at the centre, and 4⅛ inches wide, each section containing 16 square feet of heating-surface. The same firm also manufacture a smaller size of the same radiator, which is 30 inches long, 8 inches high, and 4⅛ inches wide, and contains 10 square feet of heating-surface. This radiator can also be used for hot-water heating. Each stock of indirect radiators should have a straightway valve in the supply and return pipes, and be supplied with an automatic air-valve, as shown in the cuts.

Fig. 8. Cast-iron Indirect Radiator.

RADIATOR CASINGS, HOT AND COLD AIR PIPES.

Whatever form of radiator is used, it should be encased in a box made either of No. 22 galvanized-iron, or of pine, lined with tin or zinc on the inside. Galvanized-iron is the material most generally used in Boston.

The size of the box should be such as to allow a clear space of 8 inches in height above and below the radiator. The length and width of the box should be only large enough to contain the radiator; if there is any space at either side or end of the radiator, a strip of iron should be riveted to the box, so as to close the space, that no air can pass from the bottom to the top of the box without passing through the radiator.

Each casing should be provided with either a hinged or sliding door opening into the space under the radiator.

Cold-Air Pipes.—Fresh air should be supplied to the radiator casings, through pipes of iron, tin or wood, connecting with the space under the radiator. When possible, it is best that the cold-air pipe should enter the bottom of the box. The pipe should be of sufficient size to supply all the air required, and should contain a damper for regulating the supply if desired. The opening in the exterior wall should be covered by wire netting.

The Hot-Air Pipes, are generally round tin pipes, running from the upper portion of the radiator casing to the registers in the rooms above.

The hot-air pipes should start as nearly opposite the point where the cold-air enters, as is practical, and should be a size larger than the cold-air pipes.

Figure 9 shows the ordinary casing for Gold's pin-radiator, with the exception that the pipes are generally made round, and there should always be a door on the side of the casing.

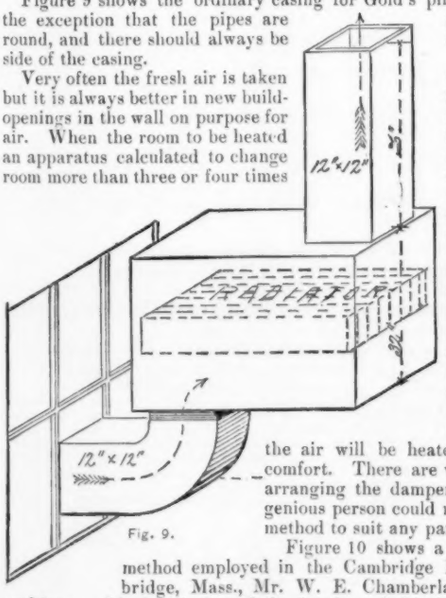


Fig. 9.

Very often the fresh air is taken from a window, but it is always better in new buildings to leave openings in the wall on purpose for supplying fresh air. When the room to be heated is ventilated by an apparatus calculated to change the air in the room more than three or four times an hour, a damper arrangement should be provided which will allow the fresh air to enter the warm-air pipes without passing through the radiator, otherwise in moderately cold days, the air will be heated too hot for comfort. There are various ways of arranging the dampers, and any ingenious person could readily devise a method to suit any particular case.

Figure 10 shows a very ingenious method employed in the Cambridge Hospital, Cambridge, Mass., Mr. W. E. Chamberlain, of Boston, architect. [A description of the heating of this building may be found in No. 8, Vol. 13, of the *Sanitary Engineer*].

The fresh air enters by the pipe A, and in cold weather enters the bottom of the box, the damper D being raised. The hot air ascends through the pipe H. When the room above is too warm, the damper D is lowered, and the fresh air passes over the radiator, and enters the hot-air pipe, without being heated. As the damper can be opened any desired amount, the amount of unwarmed air entering the room can be regulated at will. This insures a constant supply of fresh air, at any temperature desired.

The upper end of the damper is connected by a chain with a pull-and-stop mechanism within the room heated, so that the attendant can regulate the heat of the air without leaving the room.

POSITION OF THE REGISTERS.

Where possible the hot-air registers should be placed in one of the inside walls of a room, either just above the floor, or at a height of six feet or more. The writer has found that when a room is heated by two stocks of radiators, a very good result is obtained by having the two warm-air registers on one of the inner sides, just above the floor, and the foul-air registers on the opposite side at the same level.

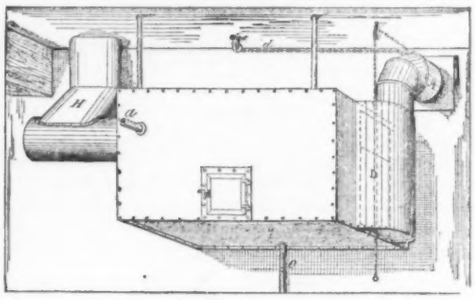


Fig. 10.

Mr. W. R. Briggs, architect, designed a high school-house in Bridgeport, Conn., in which the warm air entered the room through a register placed in one of the inner corners of the room 8 feet above the floor. The outgoing flue was placed directly under the platform, which is located in the same corner as the introduction flue. It was found that the hot air followed along on the ceiling, down the outer walls where it was cooled, and then back to the foul-air outlet under the platform.

In hospital wards, the prevailing method of ventilation is to place the warm-air registers in the walls under the window, and the foul-air registers in the floor nuder the beds. F. E. KIDDER.

[To be continued.]

SAFE BUILDING.—IV.[1]

SHEARING.

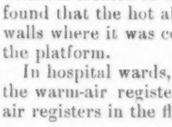


Fig. 6.

IN compression the fibres are shortened by squeezing; in tension they are elongated by pulling. In shearing, however, the fibres are not disturbed in their individualities, but slide past each other.

When this sliding takes place across the grain of the fibres, the action of shearing is more like cutting across. When this sliding takes place along the grain, the action of shearing is more like splitting. Thus, if a very deep, but thin, beam is of short span and heavily loaded, it might not break transversely, nor deflect excessively, but shear off at the supports, as shown in Figure 6, the action of the loads and supports being like a large cutting-machine, the weights cutting off the central part of beam and forcing it downwards past the support. This would be shearing across the grain.

If the foot of a main rafter is toed-in to the end of a tie-beam, and the foot forces its way outwardly, pushing away the block or part of tie-beam resisting it (splitting it out as it were), this would be shearing along the grain.

In most cases (*except in transverse strains*) the load is directly applied to the point being sheared off; the strain will, therefore, just equal the load, and we have: —

$$s = w.$$

Where s = the amount of the shearing strain.
" w = " " " load.

The stress will be equal to the area of cross-section (affected by the shearing strain) multiplied by the amount of resistance to separation from each other that its fibres are capable of.

This amount of resistance is found by tests and experiments, and is given for each material per square inch of cross-section. A table of constants for resistance to shearing of different materials will be given later; in the formulæ these constants are represented by the letter g for shearing across the grain, and g_1 for shearing along the grain.

We have, then, for the stress: —

$$v = a.\ g.$$

Where v = the amount of ultimate stress.
Where a = the area of cross-section in square inches.
Where g = the ultimate resistance to shearing across the grain per square inch.

Therefore, the fundamental formula (1) $v = s.\ f$, becomes for pieces under shearing strains across the grain: —

[1] Continued from page 212, No. 540.

$a.\ g = w.\ f$, or :—

$$w = a.\left(\frac{g}{f}\right) \qquad (7)$$

And similarly, of course, we shall find :—

$$w = a.\left(\frac{g_1}{f}\right) \qquad (8)$$

Where w = the safe-load.

Where a = the area of cross-section in square inches, at the point where there is danger of shearing.

Where $\left(\frac{g}{f}\right)$ = the safe-resistance to shearing *across* the fibres per square inch.

Where $\left(\frac{g_1}{f}\right)$ = the safe-resistance to shearing *along* the fibres per square inch.

Example.

At the lower end of a vertical wrought-iron flat bar is suspended a load of eight thousand pounds. The bar is in two lengths, riveted together with one rivet. What diameter should the rivet be?

The strain on the rivet will, of course, be a shearing strain across the grain, and will be equal to the amount of tension on the bar, which we know is equal to the load. We use Formula (7), and have :—

$w = 8000$ pounds.

The safe shearing for wrought-iron is about ten thousand pounds per square inch ; inserting this in formula, we have :—

$$8000 = a.\ 10000, \text{ or } a. = \frac{8000}{10000} = \frac{4}{5}.$$

The area of rivet must, therefore, be four-fifths of a square inch. To obtain diameter, we know that :—

$$d = \sqrt{\tfrac{14}{11}.a} = \sqrt{\tfrac{14}{11}.\tfrac{4}{5}} = \sqrt{\tfrac{56}{55}} = \sqrt{1,01818}$$

This is, practically, equal to one ; therefore, the diameter of rivet should be 1″.

In transverse strains the (vertical) cross-shearing is generally not equal to the load, but varies at different points of the beam or cantilever. The manner of calculating transverse strains, however, allows for straining only the edges (extreme fibres) up to the maximum ; so that the intermediate fibres, not being so severely tested, generally have a sufficient margin of unstrained strength left to more than offset the shearing strain. In solid beams it can, therefore, as a rule, be overlooked, except at the points of support. (In plate-girders it must be calculated at the different points where weights are applied.) The amount of the shearing at each support is equal to the amount of load coming on or carried by the support.

We must, therefore, substitute for w in Formula (7) either p or q, as the case may be, and have at the left-hand end of beam for the safe resistance to shearing :—

$$p = a.\left(\frac{g}{f}\right) \qquad (9)$$

And at the right-hand end of beam :—

$$q = a.\left(\frac{g}{f}\right) \qquad (10)$$

Where p = the amount of load, in pounds, carried on the left-hand support.

Where q = the amount of load, in pounds, carried on the right-hand support.

Where a = the area of cross-section, in inches, at the respective support.

Where $\left(\frac{g}{f}\right)$ = the safe resistance, per square inch, to cross-shearing.

Example.

A spruce beam of 5′ clear span is 24″ deep and 3″ wide ; how much uniform load will it carry safely to avoid the danger of shearing off at either point of support?

The beam being uniformly loaded, the supports will each carry one-half of the load ; if, therefore, we find the safe resistance to shearing at either support, we need only double it to get the safe load (instead of calculating for the other support, too, and adding the results).

Let us take the left-hand support. From Formula (9) we have :—

$$p = a.\left(\frac{g}{f}\right)$$

Now, we know that $a = 24.3 = 72$ square inches.

The ultimate resistance of spruce to cross-shearing is about thirty-six hundred pounds per square inch ; using a factor-of-safety of ten, we have for the safe resistance per square inch :—

$$\left(\frac{g}{f}\right) = \frac{3600}{10} = 360 \text{ pounds.}$$

We have, now :—

$p = 72.360 = 25920$ pounds.

Similarly, we should have found for the right-hand support :—

$q = 25920$ pounds. And as :—

$u = p + q = 51840$ pounds,

that will, of course, be the safe uniform load, so far as danger of shearing is concerned.

The beam must also be calculated for transverse strength, deflection and lateral flexure, before we can consider it entirely safe. These will be taken up later on.

Should it be desired to find the amount of vertical shearing strain x at any point of a beam, other than at the points of support, use :—

$$x = \left\{\begin{matrix} p \\ \text{or} \\ q \end{matrix}\right\} - \Sigma w \qquad (11)$$

Where x = the amount of vertical shearing strain, in pounds, at any point of a beam.

Where $\left\{\begin{matrix} p \\ \text{or} \\ q \end{matrix}\right\}$ = the reaction, in pounds, (that is, the share of the total loads carried) at the *nearer* support to the point.

Where Σw = the sum of all loads, in pounds, between said *nearer* support and the point.

When x is found, insert it in place of w, in Formula (7), in order to calculate the strength of beam necessary at that point to resist the shearing.

Example.

A spruce beam, 20′ long, and 8″ deep, carries a uniform load of one hundred pounds per running foot. What should be the thickness of beam 5′ from either support, to resist safely vertical shearing?

Each support will carry one-half the total load ; that is, one thousand pounds ; so that we have for Formula (11) :—

$$\left\{\begin{matrix} p \\ \text{or} \\ q \end{matrix}\right\} = 1000 \text{ pounds.}$$

The sum of all loads between the nearer support and a point 5′ from support will be :—

$\Sigma w = 5.\ 100 = 500$ pounds.

Therefore, the amount of shearing at the point 5′ from support will be :—

$x = 1000 - 500 = 500$ pounds.

Inserting this in Formula (7) we have :—

$$500 = a.\left(\frac{g}{f}\right), \text{ or, } a = \frac{500}{\left(\frac{g}{f}\right)}$$

We have just found that for spruce,

$$\left(\frac{g}{f}\right) = 360 \text{ pounds.}$$

Therefore, $a = \frac{500}{360} = 1,39$ square inches.

And, as $b.\ d = a$, or $b = \frac{a}{d}$, we have, $b = \frac{1,39}{8} = \frac{1''}{6}$

This is such a small amount that it can be entirely neglected in an 8″ wooden beam.

To find the amount of vertical shearing at any point of a cantilever, other than at the point where it is built in, use :—

$$x = \Sigma w \qquad (12)$$

Where x the amount of vertical shearing strain, in pounds, at any point of canti-lever.

Glossary of Symbols.—The following letters, *in all cases*, will be found to express the same meaning, *unless distinctly otherwise stated*, viz. :—

a = *area*, in square inches.
b = *breadth*, in inches.
c = constant for *ultimate resistance to compression*, in pounds, per square inch.
d = *depth*, in inches.
e = constant for *modulus of elasticity*, in pounds-inch, that is, pounds per square inch.
f = *factor-of-safety*.
g = constant for *ultimate resistance to shearing*, per square inch, across the grain.
g_1 = constant for *ultimate resistance to shearing*, per square inch, lengthwise of the grain.
h = *height*, in inches.
i = *moment of inertia*, in inches. [See Table I.]
k = *ultimate modulus of rupture*, in pounds, per square inch.
l = *length*, in inches.
m = *moment or bending moment*, in pounds-inch.
n = *constant* in Rankine's formula for compression of long pillars. [See Table I.]
o = the *centre*.
p = the *amount* of the *left-hand re-action* (or support) of beams, in pounds.
q = the *amount* of the *right-hand re-action* (or support) of beams, in pounds.
r = *moment of resistance*, in inches. [See Table I.]
s = *strain*, in pounds.
t = constant for *ultimate resistance to tension*, in pounds, per square inch.
u = *uniform load*, in pounds.
v = *stress*, in pounds.
w = *load at centre*, in pounds.
x, y and z signify *unknown quantities*, either in pounds or inches.
δ = *total deflection*, in inches.
ρ^2 = *square of the radius of gyration*, in inches. [See Table I.]
$\mathfrak{D}$ = *diameter*, in inches.
$\mathfrak{r}$ = *radius*, in inches.
π = 3.14159, or, say, 3.1-7 signifies the *ratio of the circumference and diameter of a circle*.

If there are more than one of each kind, the second, third, etc., are indicated with the Roman numerals, as, for instance, a, a_{I}, a_{II}, a_{III}, etc., or b, b_{I}, b_{II}, b_{III}, etc.

In taking moments, or bending moments, strains, stresses, etc., to signify at what point they are taken, the letter signifying that point is added, as, for instance :—

m = moment or bending moment at *centre*.
m_{A} = " " " *point A.*
m_{B} = " " " *point B.*
m_{X} = " " " *point X.*
s = strain at *centre*.
s_{B} = " *point B.*
s_{X} = " *point X.*
v = stress at *centre*.
v_{D} = " *point D.*
v_{X} = " *point X.*
w = load at *centre*.
w_{A} = " *point A.*

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PLAN OF FIRST FLOOR

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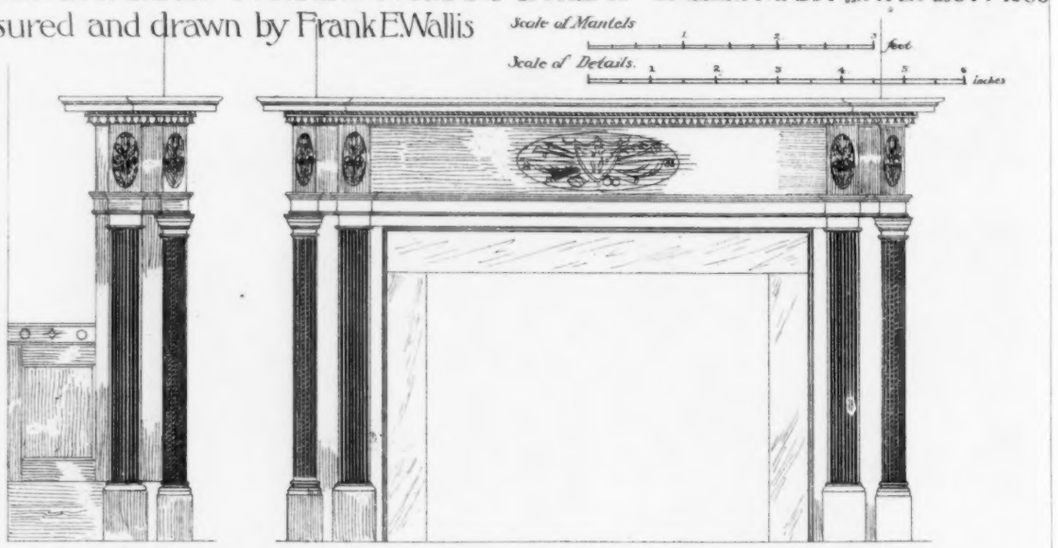
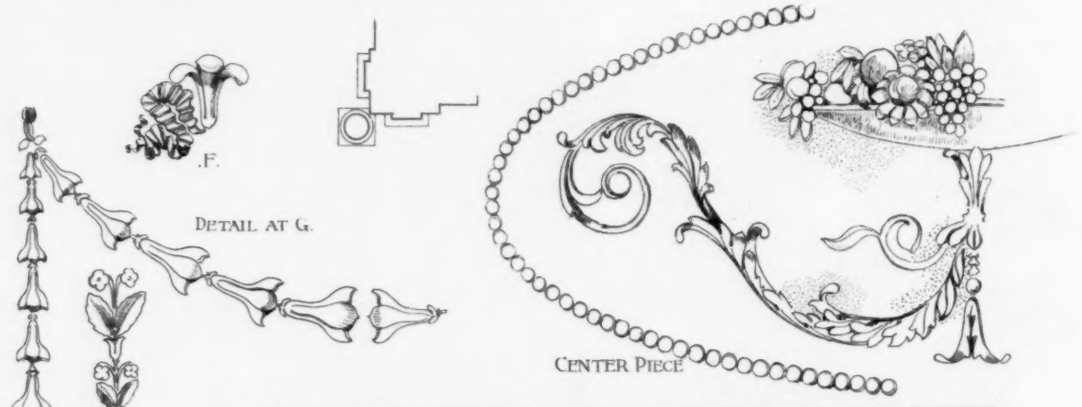
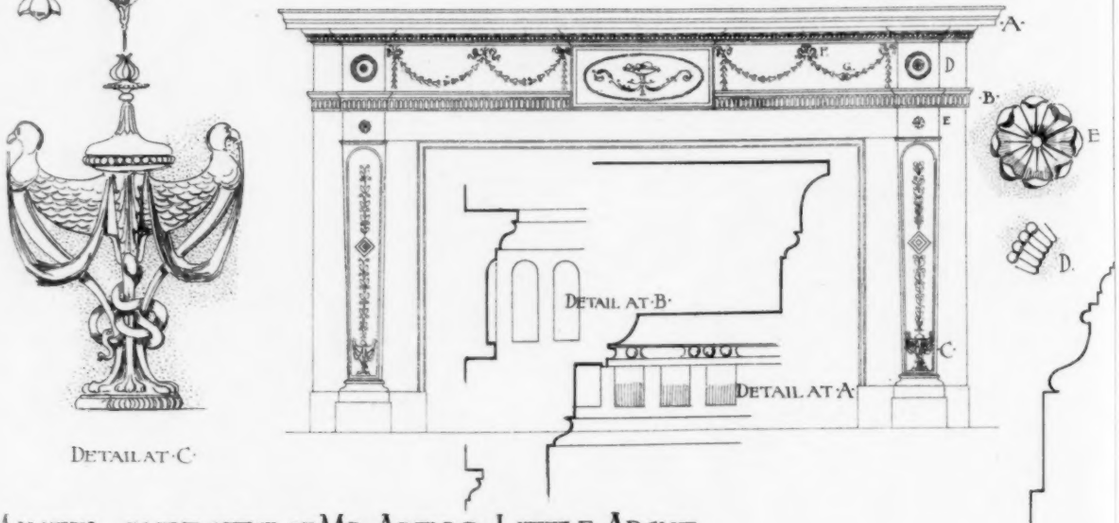
MANTEL IN PARLOR "WORKING WOMAN'S BUREAU" SALEM MASS. DATE ABOUT 1800

Measured and drawn by Frank E. Wallis







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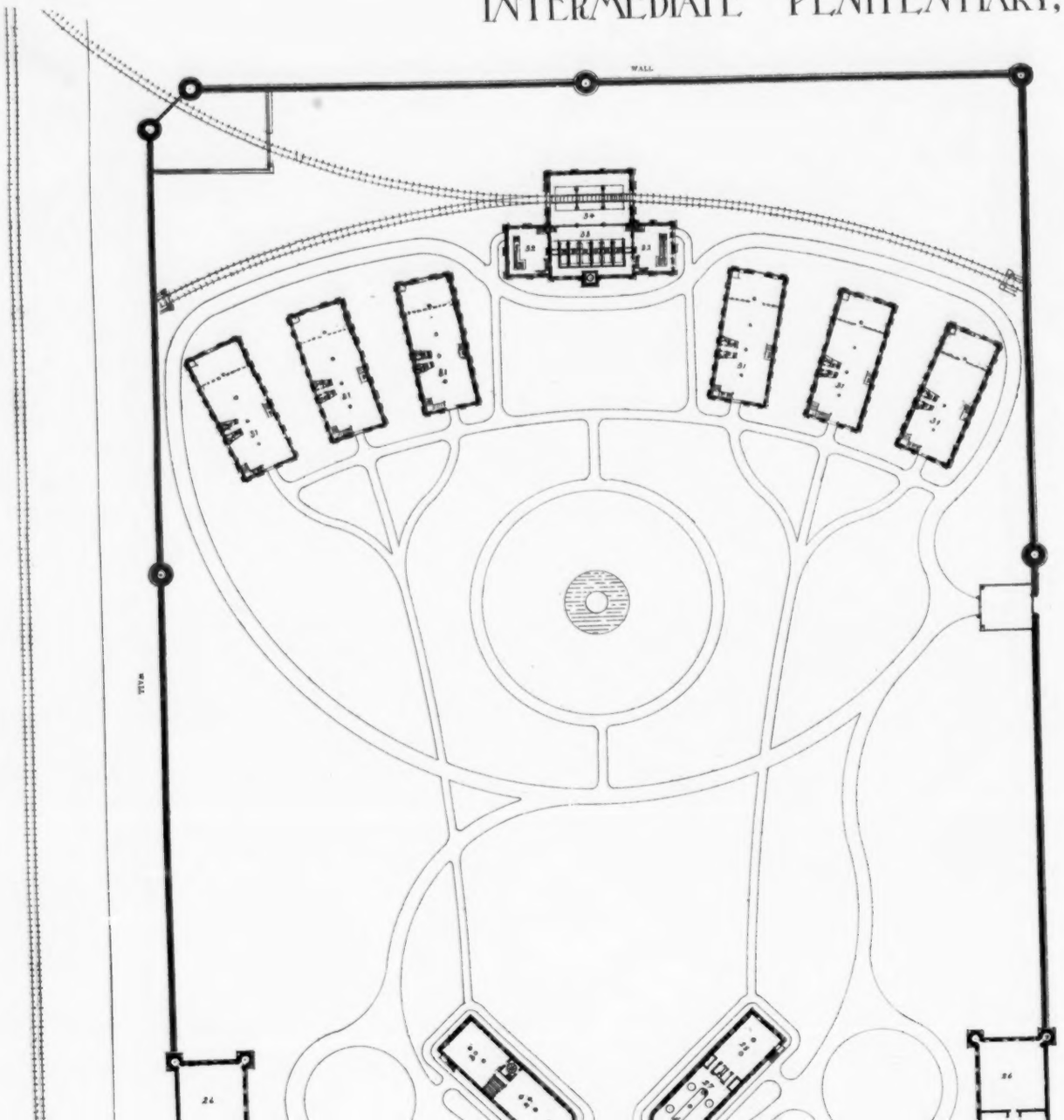
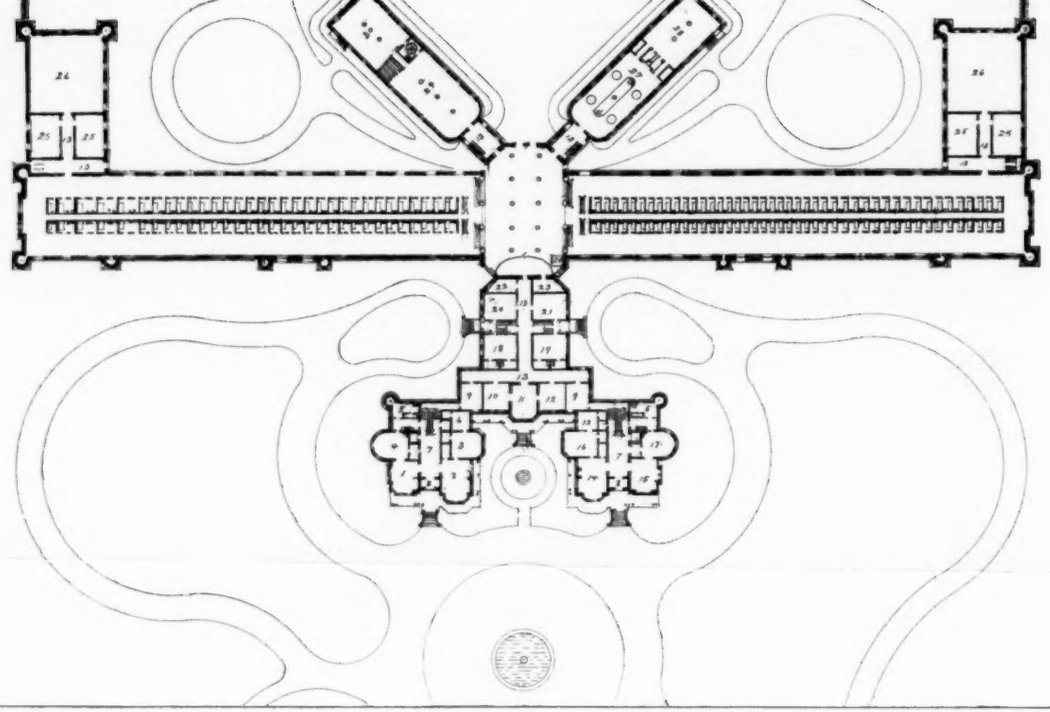


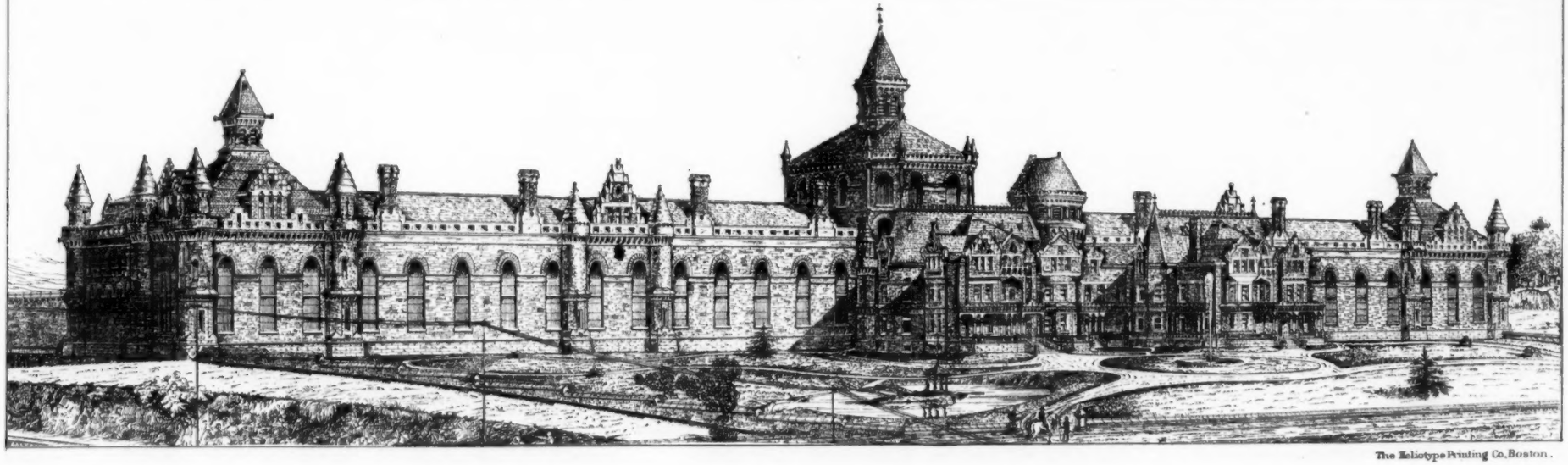
1 MANAGER'S ROOM & WARDEN'S OFFICE.
2 RECEPTION ROOM.
3 BOOK KEEPERS.
4 PRIVATE OFFICE.
5 TOILET ROOM.
6 RECORDS.
7 MAIN HALL.
8 VESTIBULE.
9 ANTE.
10 OFFICERS' SITTING ROOM.
11 " DINING "
12 " SERVING "
13 PASSAGEWAYS.
14 WARDEN'S SITTING ROOM.
15 " PARLOR.
16 " DINING "
17 " LIBRARY.
18 DEPUTY WARDEN'S OFFICE.
19 WARDEN'S EXAMINATION ROOM.
20 CLOTHING ROOM.
21 STORE "
22 GUARD'S SLEEPING ROOM.
23 ARMORY.
24 ELEVATOR TO HOSPITAL.
25 SCHOOL LIBRARY.
26 TEACHER'S ROOM.
27 KITCHEN.



N.Y.P.&O.R.R.

25 School Library.
26 Teachery Room.
27 Kitchen.
28 Bakery.
29 Folding Room.
30 Laundry.
31 Work Shop.
32 Engine Room.
33 Boiler ,,
34 Coal Depot.

Levi T. Scofield. Architect,
Cleveland, O.



The Heliotype Printing Co. Boston.

AMERICAN ARCHITECT AND BUILDING NEWS, JUNE 5 1886. No. 545

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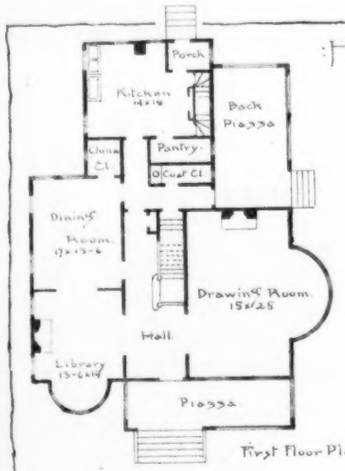
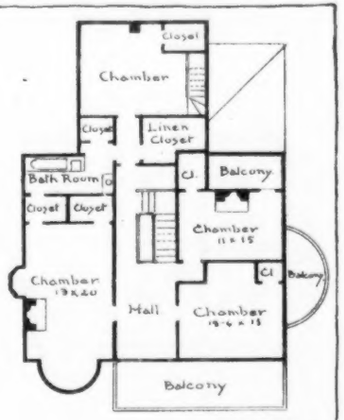
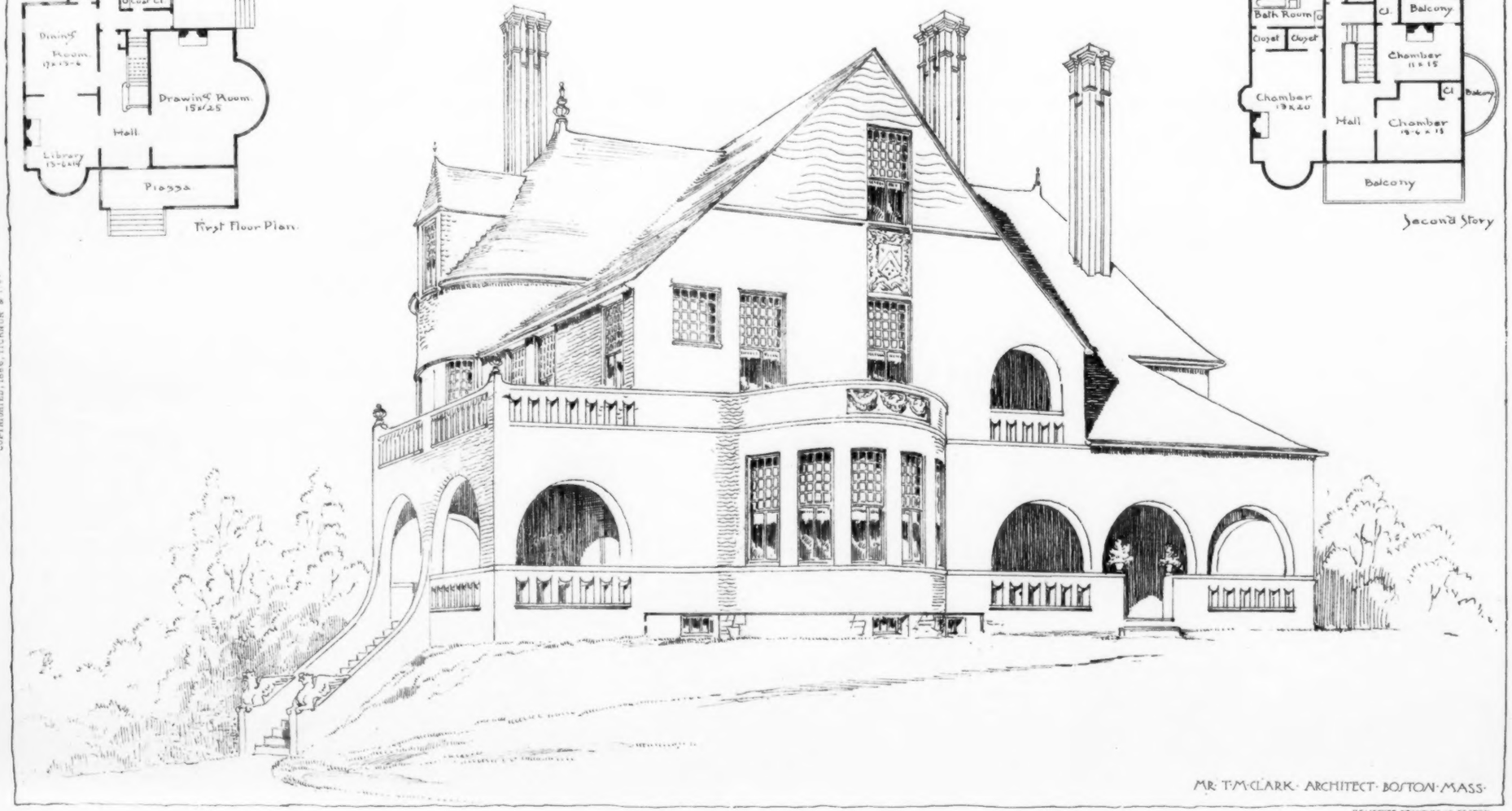


First Floor Plan.



Second Story



MR. T. M. CLARK. ARCHITECT. BOSTON. MASS.

HELIOTYPE PRINTING CO. BOSTON.

Where Σw the sum of all loads between the *free* end and said point.

To find the strength of beam at said point necessary to resist the shearing, insert x for w in Formula (7).

In transverse strains there is also a *horizontal* shearing along the entire neutral axis of the piece. This stands to reason, as the fibres above the neutral axis are in compression, while those below are in tension, and, of course, the result along the neutral line is a tendency of the fibres just above and just below it, to slide past each other or to *shear* off along the grain.

We can calculate the *intensity* (not amount) of this horizontal shearing at any point of the piece under transverse strain.

If x represents the amount of vertical shearing at the point, then the intensity of horizontal shearing at the point is $= \frac{3}{2}\frac{x}{a}$.

If this intensity of shearing does not exceed the safe-constant $\left(\frac{g_1}{f}\right)$ for shearing along the fibres, the piece is safe, or: —

$$\frac{3}{2}\cdot\frac{x}{a} = \left(\frac{g_1}{f}\right) \qquad (13)$$

Where x is found by formulæ (11) or (12) for any point of beam, or,

Where $x = \left\{\begin{matrix} p \\ \text{or} \\ q \end{matrix}\right\}$ = the amount of supporting force, in pounds, for either point of support.

Where a = the area of cross-section in square inches.

Where $\left(\frac{g_1}{f}\right)$ = the amount of safe resistance, per square inch, to shearing along fibres.

Example.

Take the same beam as before. The amount of vertical shearing 5′ from support we found to be five hundred pounds, or: —

$$x = 500.$$

The area was 8″ multiplied by thickness of beam, or: —

$$a = 8\,b.$$

The ultimate shearing along the fibres of spruce is about four hundred pounds per square inch, and with a factor-of-safety of ten, we should have: —

$$\left(\frac{g_1}{f}\right) = \frac{400}{10} = 40.$$

Inserting this in Formula (13) $\frac{3}{2}\cdot\frac{500}{8b} = 40$

or $b = \frac{1500}{16.40} = 2,''34.$

The beam should, therefore, be at least $2\frac{1}{4}''$ thick, to avoid danger of longitudinal shearing at this point. At either point of support the vertical shearing will be equal to the amount supported there; that is, one-half the load, or one thousand pounds. Substituting this for x in Formula (13), we have: —

$$\frac{3}{2}\cdot\frac{1000}{8b} = 40, \text{ or } b = \frac{3000}{16.40} = 4,''68.$$

The beam would, therefore, have to be $4\frac{3}{4}''$ thick at the points of support, to avoid danger of longitudinal shearing. The beam, as it is, is much too shallow for one of such span, a fact we would soon discover, if calculating the transverse strength or deflection of beam, which will be taken up later on. It will also be found that the greater the depth of the beam, the smaller will be the danger from longitudinal shearing, and, consequently, to use thinner beams, it would be necessary to make them deeper.

THE ILLUSTRATIONS

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

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OLD COLONIAL WORK, NO. VIII.— MANTEL IN PARLOR "WORKING WOMAN'S BUREAU," SALEM, MASS. MEASURED AND DRAWN BY FRANK E. WALLIS, BOSTON, MASS.

HOUSE AT PLYMOUTH, MASS. MR. T. M. CLARK, ARCHITECT, BOSTON, MASS.

HOUSE OF WM. T. WILSON, ESQ., NEAR CATONSVILLE, MD. MESSRS. J. A. & W. T. WILSON, ARCHITECTS, BALTIMORE, MD.

THE BOSTON PARK COMMISSIONERS' REPORT.[1]

THE eleventh annual report of the Park Commissioners is a comparatively brief document and presents little to arrest the attention or to call for extended remark. The work on all the parks has been carried on in a languid fashion, owing to the small appropriation made for the purpose by a city government ambitious of a reputation for economy. Progress is, however, visible, and on the ground which is perhaps of the greatest immediate interest to the citizens, namely, that of the Back Bay, it is now possible to form some tolerably clear notion of what is reasonably to be expected in return for the outlay of fifteen hundred thousand dollars. This, we are sorrowfully compelled to say, is not much. Indeed, it is quite plain that neither the commissioners nor their landscape architect himself, expect much from it. Mr. Olmsted now speaks of his scheme as a "design for managing the fluctuating waters of the Back Bay, . . . and for avoiding unseemliness of aspect." Surely modesty cannot go farther than this, and criticism is disarmed.

But, whatever of interest Mr. Olmsted may have lost in the improvement of the Back Bay (he deprecates, and not without reason, the application of the word "park" to this region), he has transferred, it would appear, to the five hundred acres at Roxbury now formally christened the *Franklin Park*. In regard to this territory he has sent forth with the report of the commissioners, a considerable pamphlet, prepared with much care, and setting forth the principles which have governed him in laying out this park — the advantages which may be expected from it, the danger of extravagance on the one hand, and of a foolish economy on the other, the difficulty thrown about the accomplishment of a scheme like this by the impatience and unreasonable criticism of the public, with various discussion of topics more or less closely connected with the main subject. The design, as finally adopted by the commissioners, is described with much particularity and is illustrated by a large map, which has been distributed by itself, Mr. Olmsted says, for the benefit of those who may find the essay too much for their time or inclination. Certainly the public has no cause to complain of not having been sufficiently taken into the counsels of the commissioners.

A plan like this for the laying out of a square mile of rural territory is not to be intelligently criticised without more familiarity with the ground, and the conditions which determine its treatment than can be got by cursory examination. We had occasion a year or more ago to speak with some severity of the sweeping destruction of fruit trees with which Mr. Olmsted entered upon his work. Our opinion of that remarkable performance has not changed, and we are convinced that it will be long before Mr. Olmsted's plantations will present to the tired eye of the hard-worked citizen such a refreshment as he has at one stroke forever deprived them of. But we are none the less disposed to look with keen interest on the plan through which he now proposes to develop the capabilities of this "stony upland pasture," while preserving, to a certain extent, such native features as it has been endowed withal. To a certain extent, we say. The park is an irregular, squarish rectangle, as nearly as possible a square mile in extent. Mr. Olmsted has divided this territory into two portions, of which the westerly portion, occupying about two-thirds of the whole, he calls the Country Park, while the remaining, or easterly third he calls the Ante-Park. The larger portion he has indeed proposed in great measure to let alone — "nothing is to be built, nothing set up, nothing planted, as a decorative feature; nothing for the gratification of curiosity, nothing for the advancement or popularization of science." There is to be no ambitious gardening, no planting of rare and costly exotics, humble field flowers are to be preferred to "high-bred marvels," and in short the country park is to be, as far as possible, a piece of nature's handwork, "improved" as little as possible by the hand of the professional landscapist. "For this relief, all thanks."

But as if to comfort himself for so much self-denial, Mr. Olmsted

[1] Eleventh Annual Report of the Commissioners for the Department of Parks for the City of Boston for the year 1885. Notes on the plan of Franklin Park and related matters.

has accumulated in the Ante-Park, which is to the country park as "a fore-court, portico, and reception-room," a large and varied assortment of artificial features which have done serviceable duty in the metropolitan pleasure-grounds of various capitals, and which have an attractive air on the plan, but which we venture to think would, for the most part, be quite thrown away in this suburban region. The most conspicuous of these features, called the "Greeting," is thus described in the "notes": "This division is to be wholly occupied by a series of parallel and contiguous drives, rides and walks, a double length of each, under rows of trees forming a promenade or meeting ground of the Alameda type, half a mile in length. Monumental, architectural, and various decorative adjuncts, are here admissible, but not essential. There are suitable positions for statues, water-jets, baskets of flowers, bird-cages, etc." Now, the place which recurs to our memory as we read this description is the Pincian Hill, an enchanting spot where nature, art, and historic association combine to minister to the elegant leisure of a population of pleasure-seekers. Or it is Rotton Row in the centre of the greatest capital of Europe, where the wealth, fashion, ambition and ennui of all England meet to see and be seen. But there is nothing in the life of this little New England capital to create a demand for such a "Greeting" three miles out of the town. It is much the same with the Music Court, a sylvan amphitheatre, adapted to concerts."

In the Volksgarten, in the heart of Vienna, we have seen the admirable band of Strauss discoursing most eloquent music, night after night, to a gay and constantly changing company of Germans sitting at little tables with ices and beer, or promenading in the brilliantly lighted alleys of the place. But we cannot believe that Herr Gericke himself with his splendid band could invoke such a scene in any "sylvan amphitheatre" three miles out of town.

We need not pursue the subject. Other features are proposed with high-flown appellations — as the "Little Folks' Fair," "The Playstead," with its "Overlook," "Long Crouch Woods," reserved as a location for a zoölogical garden, the "Deer Park," etc., etc.— features which may in time be useful additions to the natural attractions of a suburban park but which involve a large annual expense for maintenance, and should be allowed to wait until a need for them has been shown. C.

EXPERIMENTS WITH LONDON SEWAGE.

House in St-Brielx, Brittany.
After sketch by R. Phené Spiers.

THE Metropolitan Board of Works have just now under their consideration twenty-three tenders for the building of a vessel for carrying out "sludge" to sea. It is to be a steamship capable of running ten knots an hour with 1,000 tons on board, and must, of course, have special arrangements for discharging its malodorous burden out into the deep. This step is to be regarded as an experiment, and is supplementary to other experiments that have for some time past been going on at Crossness, and the further extension of which renders the establishment down there just now exceptionally interesting.

Every middle-aged person remembers the time when all the drains of London, or thereabouts, ran pretty directly down into the Thames on both sides. This abuse of the river at London was brought to an end by the "main drainage system," which came along with three large culverts on the north side and three on the south. These huge channels cut off the connection of the drains from the Thames, and received their contents. The three on the north side of the river meet at Abbey Mills, and from thence pour their contents through three connected sewers down to Barking Creek, where the whole volume of sewage is discharged into the river on the ebb tide. That is the arrangement existing at the present moment on the north of the Thames, and the population served by this northern system comprises about two-thirds of that of the whole metropolitan district. On the south side of the river, as we have said, there are also three main sewers running parallel with the river, and cutting off from it all the minor drains. Of these three, two meet at Deptford, and the third — the high-level sewer from the neighborhood of Sydenham — joins the other two just below Deptford, and from thence there is a common sewer running down to the river at Crossness. The area served by this system is greater by half than that drained by the northern sewers, but the population within it is only about half that of the other. On the north side, therefore, they get a larger normal outpour of sewage because they have the larger population. They discharge from eighty million gallons a day — about 350,000 tons — up to one hundred and fifty million gallons. But in time of rain and storm the south side, having the greater area, gets the most flood water, and the quantity they have to deal with at Crossness ranges from sixty millions to one hundred and seventy millions gallons. They do not get all the storm-water here. There is an overflow for it at Clapham, and there is another at Lewisham. But half an inch of rain in the course of a day will make a difference to them here of 150,000 gallons.

At Crossness, then, they have to deal with sewage to the amount of from 60,000,000 to 170,000,000 gallons a day, and till recently they did here just as they are still doing at Barking Creek — that is to say, they pumped it up into a huge reservoir, and on the top of the ebb tide they opened their sluices and poured it out. Indeed, the great bulk of their sewage they are still pouring out here. They have a huge receptacle, in the shape of a brick reservoir, over six acres in extent, into which they pump up the filthy stream coming down to Deptford. It need hardly be said that this reservoir is not uncovered. Its floor consists of a series of brick "inverts," and it is roofed over with a corresponding series of arches, and the whole structure is heaped over with earth. The top of it is a field around which are trees and shrubs and flower-beds, and on the skirts of which are handsome blocks of offices, the superintendent's house, cottages for employés, etc. The six and a quarter acres of the reservoir down below this pleasant and breezy elevation are divided into four compartments. From three of the four the sewage is discharged into the river just as it is received, or at least merely deodorized. The fourth compartment has been subdivided, and the contents of these subdivisions are the subject of the interesting experiments already alluded to.

About the beginning of last year the Metropolitan Board of Works determined to see what could be done in the way of the separation of the solid portion of the sewage from the fluid. They decided to begin with about 1,000,000 gallons a day — the sewage of a population of about 36,000. Of course, if a quantity of sewage be merely allowed to remain in a tank for a time, the solid part of it, or much of it at any rate, will settle at the bottom. But experience seems to show that if certain additions be made to the sewage this process of settlement, or "precipitation," will be very much more rapid and more complete. As the result of a long series of experiments carried on with the view of determining what process would give the best results at the lowest cost, it was found best first of all to well mix up the sewage with a certain proportion of lime, and then to add to it a solution of proto-sulphate of iron. The whole compound was then run off into subsiding reservoirs, in which it was allowed to remain for not less than two hours. Of course, at this time of year the sewage is not at its worst. Decomposition is slower than in hot weather, and usually we have a good deal of rain; but a large reservoir full of sewage treated with lime and iron, inspected a day or two ago at Crossness after remaining undisturbed for a couple of hours, presented so close a resemblance to pure water that any one who did not know what it really was would have had no hesitation at all in taking a bath in it. At the end of two hours the water is drawn off. Practically, the whole of the suspended solid matter has been precipitated, but the water may, nevertheless, be full of chemical impurity, and it is, therefore, treated with permanganate of soda and discharged into the Thames. The sediment remaining at the bottom of the reservoir is swept up and plunged into "sludge settling tanks," where it is allowed to remain for twelve hours, when there will be found to be a further accumulation of water on the surface. This is drawn off, and the residuum has now to be dealt with. It throws, by the way, rather a striking light on the problem presented by London sewage to find that, after about eight feet of tolerably clear water has been drawn off from it, only about half an inch of solid sewage remains. This is not absolutely all the solid matter that was in the original sewage, but it is so nearly all that if they were to double their outlay in the perfecting of their system they could only get about another fiftieth part of solid suspended matter. This shows very strikingly the truth of what has often been said, that it is not the sewage of London, but the water added to it that constitutes the great difficulty.

The "sludge" having been eliminated from the whole volume of the sewage, there remains the question, what is to be done with it? Upon this branch of the subject experiments have also been in progress of late, and, as we have intimated, are just about to commence on a larger scale. When the Board determined last year to deal with a million gallons of sewage a day, they resolved to test the practicability of compressing this sludge by machinery, so as still further to eliminate the water from it, and reduce its bulk. They set up the necessary plant, therefore, and have been turning out about five tons a day of this solid sludge. The practicability of this process has been demonstrated, but what as yet remains to be shown is the possibility of disposing of the solidified sewage in large quantities. It is considered that the small quantity they have hitherto turned out hardly affords a criterion on this point. It may be easy enough to get rid of five tons a day; but it may be a very different matter when they come to treat the whole of the London sewage in this manner, and have some nine hundred tons a day to dispose of. Instead of one million gallons hitherto dealt with, they have determined to experiment with nine million gallons, and a press weighing forty-five tons has just been completed. In connection with this press, there are three "receivers" — strong iron receptacles, six feet by twelve feet — sunk in the ground. One of these receivers is charged with air under a pressure of one hundred pounds to the square inch. Into another is poured a certain quantity of lime, dissolved in water, and then the liquid sludge is also injected with sufficient force thoroughly to mix it well with the lime-water. The third receiver is put

under water pressure, by which the condensed air in the intermediate receiver is driven into that containing the diluted sludge, which in its turn is expelled from the receiver and forced up into the press. It will thus be seen that the actual force is hydraulic, the air-chamber being merely a buffer interposed between the water and the sewage to prevent their mixing. The pressure in the chamber — one hundred pounds to the square inch — is, of course, that under which the sewage is held in the press, which is an arrangement of iron plates and jute cloths acting as strainers, through which practically the whole of the moisture is forced, leaving a solid cake of about a third of the bulk of the liquid sludge, and having the appearance when thrown out in a heap of a lightish brown clay.

The manurial value of this compressed matter seems to be as yet a moot point. Whether its fertilizing capabilities have been washed out of it, or whether it is a valuable manure; or, again, whether, supposing its intrinsic value being assumed, farmers and market-gardeners can be convinced of its worth, are the points which, as yet, have to be conclusively settled. It may be that the value of this compressed sewage may make it an advantageous mode of dealing with the outpouring of the main sewers. On the other hand, it may prove on the whole cheaper to take three times the quantity of uncompressed sludge to the sea and throw it overboard. These are, in brief, the points which the Metropolitan Board of Works have determined to put to practical test, and, in order that the test shall be a practical one, they have, as we have said, just set up new appliances for compressing on a much larger scale than heretofore, and they are going to buy a vessel for the purpose of carrying out the sludge in its uncondensed form. Which of the two systems will be eventually adopted will depend upon the comparative results obtained.

It may be worth while to add that one interesting feature of these Crossness works is about to disappear. During the cholera scare the summer before last the Board found that all the manufacturers engaged in producing permanganate of soda could not supply anything like the quantity they required. This disinfectant ran up enormously in price, and at one time was fetching £40 a ton in the market. A factory was set up here, and the necessary plant obtained, and a large quantity was turned out at a cost of about £20 a ton, twenty tons a day being at that time required for the outfalls on both sides of the river. Further machinery was added, and eventually permanganate of soda was turned out at £12 pounds a ton. The great demand of that time, however, so developed the means of supply, that manufacturers are now tendering the disinfectant at £11 a ton, and the Board have determined to discontinue making the thing on their own account.— *The London Daily News.*

PROFESSOR RUSKIN'S GUILD OF ST. GEORGE.

THE fascination exerted upon our imaginations by the romantic features of St. George's Guild, does not spring from the novelty of the idea of such an institution (there have been many other organizations for the testing of socialistic crochets and hobbies), but from the *bizarre* and poetical nature of the founder, the astonishingly visionary character of many of his schemes, and the large financial sacrifices he has made for their realization.

The prime object of the Guild is "the general medicining, enriching, and preserving in political strength the population of Great Britain." This is to be accomplished by purchasing some pieces of ground to cultivate, subjecting the cultivators to certain rules, and educating both them and their children. There is no colony, or community, localized in a central place; but the members still follow their own business wherever they are, merely subscribing to the rules of the Guild, and contributing a small fraction of their incomes for the expenses thereof. One of the chief objects of Mr. Ruskin was to show whether refined education was not possible to persons maintaining themselves by agriculture or other useful labor, and to convince some portion of the upper classes of society of the superiority of such occupations to their favorite profession of war.

It was Mr. Ruskin's (Biblical) idea at first that every member should pay to the Guild one-tenth of his or her income; but later this idea had to be abandoned. The central plan, always kept in view, has been the agricultural one, the intention being not merely to cultivate ordinary land, but to recover barren, rocky, or marshy districts, and bring them into good bearing condition. No matter on how small a scale the thing is begun, said the founder. Better try the experiment in two or three poor men's gardens than not at all. But supposing some pieces of land of respectable size were secured, then, said he, we will ascertain the absolutely best that can be made of every acre—flowers native to the soil shall be sown in the wild places, fruit-trees planted, cottages built, pasturage extended, and every foot of the land developed to its utmost.

We are prepared, of course, to hear that in these little paradises there are to be no steam-engines, no railroads, no idleness, no equality, and "no liberty," and that laborers shall be paid fixed wages; children to be educated compulsorily in agricultural and naval schools — the boys to learn swimming or sailing; the girls, spinning, weaving, sewing, and cooking; both sexes to be taught botany, dancing, music and art, also instructed in gentleness, finished courtesy, truth-speaking, obedience. As they grow older, they are to learn the natural history of the place they live in, to know Latin, and the history of Athens, Rome, Venice, Florence, and London. Young men who deserve higher education are to receive that of a Greek gentleman of the Periclean age, plus Christianity. Boys are to be taught "thoroughly, and with awe," the physical laws relating to their bodies.

The Guild was founded in 1871, and duly registered as a limited liability company, Ruskin as first Master, making over to it a tenth of his income. He was worth at that time about $550,000. Up to July, 1876, after five years of existence, the membership of St. George's Guild numbered only thirty persons, some of them young ladies. It curiously marks the unpopular nature of the enterprise that the Master, in making his list of names, dared to give at first only the initials, and afterwards, the first and last names of such Guildsmen and Guildswomen as he thought would not blame him for so doing.

Up to July, 1877, the Guild had available cash to the amount of £3,487 12*s*. The title was changed from "Company" to "Guild" in 1877, owing to the ideas of fraudulency connected with so many companies of England (curious reason for changing). About the same time, also, the requirement of a tithe was dropped, as it had proved a grievous stumbling-block to the rich. It was now announced that anybody would be received as a Companion who, complying with the principles and methods of the association, would contribute one per cent of his or her income, up to £10 on incomes reaching a thousand a year, the understanding being that, above that amount, nothing would be asked. At the same time, the word "Companion" was reserved as the appellation of a superior order of the association, the members of which would be willing to give one-tenth of their income, while ordinary Guildsmen gave only one per cent thereof. Yet in spite of small membership and languid progress of work, it cannot be said that the Master's reform movement has borne no fruit. If proof were needed, it is afforded, for one thing, by the establishment, in 1879, of the "Ruskin Society of Great Britain," with headquarters at Manchester, and branch societies at Aberdeen and Glasgow, the chief aims being to promote the study and circulation of Mr. Ruskin's writings, to exemplify his teachings, and to aid his practical efforts for social improvement.

The work done for St. George has been not only of an interesting nature, but of considerable extent. The first piece of actual work performed seems to have been a bit of road-making at Oxford by the students. The first interest from St. George's fund Mr. Ruskin spent in the vain attempt to keep perfectly clean a bit of London street; a cloth mill has been erected in the Isle of Man, for weaving the wool of the Manx sheep; various plots of ground have been purchased, and at least one of them has been put under cultivation; Mr. Ruskin restored, at a cost of $2,500, a beautiful pool[1] at Carshalton, near the home of his boyhood (Herne Hill, by London); he has done a good deal of expensive terracing at his own residence — Brantwood, in the Lake District — where, however, the wood hyacinths and heather seem to outweigh in value the hay and strawberries. One of the most amusing projects of the Master was the establishment of a tea shop at 29 Paddington Street, London. Here the patient idealist installed two of his mother's aged servants as clerks. The idea was to sell good tea in as small packets as people chose to buy, without charging a profit on the subdivision. But the absence of illumination by gas, and the eschewing of the rhetoric of advertisements, as well as the increase in the consumption of spirits throughout the neighborhood, made sales slow. The chief check, however, on the trade of "Mr. Ruskin's Tea-shop," he thinks, was his delay in painting his sign. He could not for months determine whether the said sign should be of a Chinese character — black upon gold; or of a Japanese — blue upon white; or of pleasant English — rose color on green; and still less how far legible scale of letters could be compatible, on a board only a foot broad, with lengthy enough elucidation of the peculiar offices of the establishment. Meanwhile, rent and taxes ate up the profits, and something in addition.

But all these experiments have been only subsidiary to the main enterprise of founding a great educational museum at Sheffield. The Master intends to make his Museum of St. George the practical embodiment of all that he has taught in his writings on art and natural history. A beginning has been made; and such collections as have been got together are exhibited in a temporary museum in Upper Walkley, a hill suburb of Sheffield, inhabited chiefly by poor artisans.

The constitution of St. George's Guild has been described as that of an aristocracy, which elects an absolute chief, or doge. The members, in the order of their rank, consist of (1) the master, (2) the marshals, (3) landlords, (4) tenantry, craftsmen, and hired laborers. Without going into details as to the respective functions of these ranks, let it be said that labor and the laborer hold the place

[1] The following piece of superb English, and of exquisite sentiment, Mr. Ruskin had carved on the fountain: —

"In Obedience to the Giver of Life, of the Brooks and Fruits that feed it, of the Peace that ends it, may this Well be kept Sacred for the Service of Men, Flocks, and Flowers, and be by Kindness called Margaret's Well."

of chief honor. All measures have reference to the laborers' well-being, and the authority of the Master and the superior officers is derived from him.

The first maxim of the Guildsmen is "to do good work, whether they live or die." Marriages are to be regulated by the Guild. As to courtship, the sum and substance of Mr. Ruskin's ideas is this: No girl should reject a lover at once nor accept him at once. A girl worth anything ought to have half a dozen suitors; and she is to put them all on probation, requiring of them as many lions' skins and giants' heads as she thinks she is worth. If a lover is absolutely disliked by her, "she may send him away for seven years or so, he vowing to live on cresses and wear sackcloth meanwhile," or do something of the kind to show his worthiness. When we read such funny things as this in Mr. Ruskin's books, we begin to understand the meaning of that quizzing, mischievous look in the eyes which he is reported occasionally to show.

The members are to use no machines, except for very heavy work, and no railroads, except for speed of travel on main lines of communication.

The rents levied by St. George will differ from common rents in respect of being lowered instead of raised in proportion to every improvement made by the tenant. Furthermore, the rents will be employed in making improvements on the estates of the tenants, landlords not being allowed to take any money except what they earn by their personal labor. (This is surely a socialistic measure which would go far toward establishing the equality which Ruskin says he detests.)

There is to be a national store of wealth (idea seems to have been taken from Proudhon) instead of a national debt — the store, or reserve fund, to consist of food, clothes, books, and works of art. The government will always have enough of these in its possession to meet the entire demand of its currency in circulation. "Government!" "Currency!" thinks the reader. "Why, we shall then have a government within a government." Even so. But the creed, or constitution, of St. George demands, in its seventh article, entire loyalty to the existing administration, unless it be proved to be contrary to the laws of God. In this respect (loyalty), it exactly resembles the constitution drawn up by John Brown for his anticipated republic of blacks. John Brown suffered martyrdom. But I suppose no better proof could be asked of the visionary nature of the English John's similar movement for the liberation of the white slaves of labor than the complete indifference of the existing government to this bold little rebel flag of St. George, run up by a sick and despairing prophet in the very heart of the vast empire of Great Britain.

The only use to which the Guild will put its precious metals will be to employ them for currency and in the arts. The Guildsmen are to eat out of delft and drink out of pewter (idea taken from More's "*Utopia*." Ruskin has clearly studied all the Utopias, from Plato down to Brook Farm). There will also be paper money; but it will be a matter of financial indifference what part of the circulating medium is in coin and what in paper, since the power of each is but that of a government receipt for goods delivered into the general store.

In dress, everybody will have to look to it that he be clean as wax, and no ragged garments allowed. The dress of the superior orders and officers always to be plainer than that of the "peasants," as Ruskin calls them (this idea about dress also taken from Sir Thomas More). Hereditary nobles entering the Guild are kindly permitted to retain the insignia of their rank; but they must all promise to wear uncut jewels, if they wear any at all.

Professor Ruskin's cardinal idea of obedience is to be practically enforced with a vengeance in the government of which he is τύραννος He, at one time, actually entertained the idea of ruling his peasant-slaves (I will justify the phrase immediately) by the iron rod of the military order! He states that in early life he had known so many good and wise soldiers, and had observed so constantly in his historical reading (notice how always and always he falls back for justification upon precedent, upon the past) the beneficence of military rule in time of peace, that he had seriously thought of choosing the commandants of the Guild from veteran soldiers. It was also his intention to select the laborers from such domestics and retainers of old families as had been thrown out of employment by modern social changes (these persons attractive to him because of their habits of unquestioning obedience). Well, when he had thus provided for discipline, let us see how he would crack his whip over his coffles of peasant slaves (*Fors*, I., Letter 37). The laboring Guildsmen are *compelled*:—

(1) To rent their land temporarily of the Master; and they can be ejected, if they prove intractable.[1]

(2) To pay over one per cent of their incomes for St. George's Benevolent Fund.

(3) To cultivate their land as the overseer may direct.

(4) To build their houses with prescribed materials, and to a fixed degree of strength.

(5) To send their children to the schools where Mr. Ruskin's ideas on education will be carried out.

(6) To take no newspaper except the one to be published by the Master, and to read no books but those published, edited, or selected for the Guild's library by him.

(7) Each and all to render "unreasoning obedience," solemn and constant, to the officers set over them.

(8) To use only such machinery as the Master may direct.

(9) To obey, in general, the laws of Plato, Christ, Lord Bacon, Sir Thomas More, and the Florentines of Dante's time.

(10) Every tradesman's books must be open to inspection on the Master's order, and his entire business affairs, including the percentages paid to clerks and producers, known to everybody.

(11) "And finally," says Ruskin, "people whom I catch doing as they like will generally have to leave the estate!"[2]

At this point, I make no doubt my readers are rubbing their eyes and asking themselves just where about in time they really are, and if they are in possession of their senses. Don't tremble or get alarmed, dear friends. Our liberties are still safe: there is no danger of Professor Ruskin being intrusted with autocratic power. He is only dreaming, after all. Will you examine a specimen law of our ideal government? It is only six hundred years old, and comes from Florence. The law away back there was that no citizen should buy fish to sell again to middlemen. In this way, you get fresh fish, do you see? Now, we must have this law in St. George's Guild. But how to get our fish to their proper market and sold? Why, what else have the sons of the fishermen to do, and what else have idle clergymen to do, better than to peddle good fish? The day must come (says Ruskin, in all seriousness) when gentlemen will turn fish-mongers, and, hiring themselves out to the fishermen, take dripping basket on back, and cry their finny wares through the cities!

"They may stagger on, perhaps, a year or two more in their vain ways; but the day *must* come when your poor, little, honest puppy, whom his people have been wanting to dress up in a surplice and call 'The to be Feared,' that he might have pay enough, by tithe or tax, to marry a pretty girl, and live in a parsonage, — some poor, little, honest wretch of a puppy, I say, will eventually get it into his glossy head that he would be incomparatively more reverend to mortals, and acceptable to St. Peter and all the saints, as a true monger of sweet fish than a false fisher for rotten souls; and that his wife would be incomparably more 'ladylike,' not to say madonna-like, marching beside him in purple stockings and sabots, or even frankly barefoot, with her creel full of caller herring on her back, than in administering any quantity of ecclesiastical scholarship to her Sunday schools.

"'How dreadful, how atrocious!' thinks the tender clerical lover. '*My* wife walk with a fish-basket on her back!'

"'Yes, you young scamp, you. You were going to lie to the Holy Ghost, then, were you, only that she might wear satin slippers and be called a lady!'"—*William Sloane Kennedy's letter to the Index.*

THE BUILDING OF STABLES.

Duomo Bologna Italy. July 7th 1883 from sketch by W. J. Hillard

IT may be well to preface this article by saying that the following remarks are a brief summary of the *desiderata* in stable-building, as regarded from the point of view of the owner of the horses to be provided for. The subject is sufficiently important to make a non-professional opinion of some value.

It is surprising to observe how careful many persons are as to the construction and fitting-up of their houses — how careless they are in regard to their stables. It is true that more intelligence is now shown in the management of horses than was visible even a few years ago, but that progress is still of a comparative character; so that the carelessness about the stables arises from a kind of popular ignorance in regard to the management of horses. Continually those who take a personal interest in everything which concerns their houses will be found to leave the stable management entirely to itself. Hence, the construction and fitting of stables are often left altogether to the architect and builder. The former has quite enough to do with looking after the house without troubling much about stables, and in all probability he has seldom studied this question from a practical point of view. He will plan a picturesque and pleasing exterior, and then his task is over. But too often the owner of the premises does not give him free scope, even in regard to this. If he interferes, it is on the stables where the money is to be saved, and over and over again stables may be seen wholly inferior in architectural character to the house, simply because the owner, while feeling it necessary to erect stables, has thought it advisable to spend as little money upon them as possible. Badly-constructed stables are never economical, and in many cases a little extra money spent on them will repay itself in the better condition of the horses which will have to inhabit them.

A cardinal principle in the erection of stables is the selection of a site. Stables are too often put up in any back region, but they should always be built in the warmest and sunniest aspect which is obtainable. Not warmed, as are houses, artificially: the warmth of the sun

[1] All of these conditions may be found in various parts of *Fors Clavigera* and *Time and Tide*, whence I have culled them forth.

[2] So Carlyle, in "*Shooting Niagara*," suggests that the English lords might form their estates into miniature and model communities, drilling and disciplining their tenants, and *banishing the refractory*. How all this arrogance of Ruskin and Carlyle contrasts with the spirit of gentle Walter Scott, who, though ostensibly as conservative as his two countrymen, yet, when he was settling a few families at Abbotsford, made only two conditions: first, that they should keep their cottages and doorways and little gardens tolerably neat; and second, that the men should keep their guns from the game, and the boys their hands from the birds' nests and newly-planted woods! (Lockhart's *Life*, vol. v., p. 289, original edition).

is most necessary to keep them as dry and warm as possible. Dryness is very essential for good stables, and, therefore, a site where drainage is easy and good should be selected. Damp stables will cause disease not only in the lungs and bronchial tubes of a horse, but also in his feet, and may cost the owner not only anxiety, but money. It has to be borne in mind, also, that both sunny and dry stables are requisite for keeping carriages in proper condition. Hence, no one should build a stable or coach-house except on a dry site and with a warm aspect.

Another element in regard to the construction of stables of the highest importance is that they should be built as substantially as possible. Warm stables in winter are absolutely necessary for horses, if they are to look well and do their work well, and equally in summer they should be cool.

The aim of the builder of stables should, in fact, be to erect them so that they may be kept internally at a moderate and equal temperature throughout the year, so far as that is possible. Horses come warm into a stable, and they cannot, as we can, stand with their backs to the fire. Hence, it is most necessary that in winter-time they should not be received into stables which will chill them. On the other hand, too much care cannot be taken in regard to ventilation.

Many horses are lost every year owing to insufficient ventilation. The stables get hot and close, and a horse is stripped of his clothing and brought into the cold air. The human being, with much the same constitution, puts on an overcoat when he turns out. It is not surprising, therefore, that horses get colds, coughs, and sometimes die, sometimes become permanently injured in their wind. While, therefore, a stable should be temperate, it should not be hot, and accordingly the ventilating apparatus should be as effectual and as easily worked as possible. Barely one stable in ten is properly ventilated, and artificial warmth is never supplied, though most stables might obtain it from the harness-room fires by means of hot flues or hot-water pipes connected with the boiler, to be used according to the external atmosphere.

The fitting-up of the stable will hardly, perhaps, be considered as within the province of an architect, but it is a matter with which every architect should be acquainted. The great point to bear in mind is that loose-boxes should be put up, and not stalls. The common practice is to have about three stalls to one loose-box, whereas the proportion should be reversed. The freedom which a horse has in a loose-box is of vital importance. To point out the reasons for this would be to go into matters scarcely fitted for this journal, but, whether for actual general health, or for keeping a horse sound in his legs, a loose-box is very necessary. There is no need to have them large, but loose-boxes should be sufficiently roomy for a horse to turn in with comfort. There are many stalls which, with an extra foot of breadth, would make reasonably good loose-boxes.

We may shortly summarize a few more hints. The harness-room should never be a passage-room, though, on the other hand, it should be directly connected with the stables. Where the stables are large, it should be double, in the nature of a scullery and a kitchen, the outer harness-room for rough work, the inner for keeping saddles, etc., and for doing lighter and cleaner work. Large coach-houses are to be avoided; several smaller ones are better. To have several carriages packed in one coach-house causes them to be constantly knocked and bruised, whereas, when one, or at most two, carriages occupy one house, they are not so likely to receive damage. When stables are of any size there should always be one or more large, loose-boxes at a distance from the general range of stabling for the use of young horses, or mares with a foal, or for the purpose of summering hunters. If possible, the stable should be planned so as to be connected with a small grass paddock — a mere plot of grass is sufficient. This serves as a place for a horse to be turned into in spring or summer for an hour or two, occasionally, and as an exercising ground when a track is laid down with straw in hard winters. Again, every stable should be provided with one or two sleeping-rooms, which should be over the harness-room. As to the drainage, it goes without saying that it should be as perfect as possible. It may be said that the stables we have described are small, but the same principles are applicable to large ones, and, in all respects, the latter are but the small ones multiplied. Having regard to the great value of horses, to the carelessness, economical views, or ignorance of so many, if not most, horse-owners, architects should always do their best to insist on stables being erected on intelligent principles and in the best possible manner.— *Builder.*

SOCIETIES

AMERICAN INSTITUTE OF ARCHITECTS.

THE Board of Trustees of the American Institute of Architects, in recording the decease of a late Honorary Member of the Institute, James Fergusson, F. R. S., M. R. A. S., F. R. I. B. A., etc., etc., desire to express their high estimate of his eminently valuable and productive labors in the field of historical architectural criticism, and of his profound and extended researches into the origin and development of architectural styles. His grand work on East Indian Architecture stands unique, and will always be a mine of wealth for future investigators. His "*History of Architecture*," developed from his previously-issued "*Handbook*," forms the highest authority on the subject for English-speaking architectural students and connoisseurs; while these and his many other architectural writings, published during an active career of authorship of forty years, all attest the depth of his scholarship and his earnest devotion to the cause of good architecture—a devotion which those who were fortunately brought into contact with the man found to be as sincere as it was enthusiastic.

Much of the modern catholic and sympathetic appreciation of the beauties peculiar to each style is owing to his teachings, and the influence of his work is felt in all directions by the present generation of architects.

A most notable fact in connection with Mr. Fergusson's long and highly honorable career is that he was not educated to architecture, either as a practitioner or an amateur, but to mercantile pursuits, and that he voluntarily gave up fine prospects in this direction for the sake of devoting himself to the disinterested study of architecture and to the literary elaboration of the history of its forms. The profession, while deeply mourning his loss, should feel grateful that he was yet spared to an advanced age, while retaining in its behalf and in that of the cultured public, the full vigor and active use of his faculties to the end.

Adopted in Board of Trustees, A. I. A., May 21, 1886, and ordered to be forwarded to *American Architect* for publication.

GEO. C. MASON, JR.,
Secretary, A. I. A.,

Per A. J. BLOOR, *Secretary, pro tem.*

NEW YORK CHAPTER, A. I. A.

Whereas, the New York Chapter of the American Institute of Architects have heard, with deep regret, of the demise of Henry Hobson Richardson, a Fellow of the Institute, and, during his residence in New York, a member of this Chapter, therefore:—

Resolved, that in his death, after a long and courageous struggle with painful and incurable disease, the profession in which he so masterfully labored has lost an associate whose whole strength was in vital alliance with his art, and whose productions have not been surpassed by those of any of his compatriots, and have contributed, certainly not less than any, to give our new country a distinct claim, before the world, to a rank in the domain of Art, somewhat commensurate with that position in other fields of civilization which it already filled. At the same time they amply illustrate the value to every professional aspirant, no matter how well gifted by nature, of long and careful training in his proposed specialty; while the splendid results that may be attained by persistent application in one school of architectural expression is not less strongly marked in his career.

Resolved, that the above preamble and resolution, signed by the President and Secretary of the Chapter, be transmitted to Mr. Richardson's family, with an expression of condolence in their affliction.

ILLINOIS STATE ASSOCIATION OF ARCHITECTS.

THE committee of the Illinois State Association of Architects, appointed to frame a proposed State law to regulate the sanitary construction of buildings, held an important meeting yesterday at the rooms of Adler & Sullivan in the Borden Block. There were present, Frederick Baumann, Dankmar Adler and William Holabird, of the committee; and Dr. John H. Rauch, Secretary of the State Board of Health; Dr. Oscar C. DeWolf, Health Commissioner of Chicago, and W. H. Genung, of his department; S. G. Artingstall, City Engineer, and O. A. Cheney, Superintendent of the Sewerage Department.

The topic first taken up was the form which the proposed legislation should take. Mr. Baumann advocated a law which should appoint a commission and give it power to make regulations and enforce them. He advocated this because it would permit changes to be made in the regulations as experience or scientific inquiry would suggest. This form of law was opposed by Dr. DeWolf because the regulations could not be enforced by penalties, and he held that the Supreme Court of the State had decided that an appointed body could not exercise legislative functions. He claimed that to secure the most positive enforcement, the law must be as specific as possible.

A specific law being tacitly considered a necessity, the discussion took a wide range, involving many more points in sanitary construction. The use or disuse of catch-basins, the placing of plumbing pipes in sight, the connection of privy-vaults with the sewers, and the responsibility the architect bears in the sanitary construction of a building, and other questions were thoroughly discussed. While no provisions were actually agreed upon, it was considered that a great advance had been made in coming to a mutual understanding. The committee will select a lawyer and draft a bill which will be submitted at another conference.—*Sanitary News.*

TO SOFTEN HARD PUTTY.— To soften putty that has become hard by exposure, so as to remove it easily from a sash, take one pound of pearlash and three pounds of quick stone lime; slack the lime in water, then add the pearlash, and make the whole about the consistency of paint. Apply it to the putty on both sides of the glass, and let it remain for twelve hours, when the putty will be so softened that the glass may be taken out of the frame with the greatest facility.

COMMUNICATIONS

[*We cannot pay attention to the demands of correspondents who forget to give their names and addresses as guaranty of good faith.*]

WINDMILLS FOR WATER-SUPPLY.

New York, May 28, 1886.

To the Editors of the American Architect:—

Dear Sirs,—I am informed that the last issue of your valued journal contains a reprint of my paper on "Windmills for Water Supply," published by me, over my signature, in *Engineering News*, December, 1885, but that you credit the paper to the *Hydraulic* or *Sanitary Plumber*, not mentioning my name or the *Engineering News*. Knowing the high sense of honor of your journal, I feel certain that your action in this matter is either an oversight or the result of misunderstanding of the facts. I know you will be pleased to make proper correction in your next issue.

Very respectfully, Alfred R. Wolff.

[The article referred to was, we believe, properly credited by us to the journal in which we found it printed, and, as we had no clue either to its original place of publication, or to its author's name, we were not conscious of doing injustice to any one.—Eds. American Architect.]

VERMIN IN SOUTHERN PINE.

New Orleans, La., May 22, 1886.

To the Editors of the American Architect:—

Dear Sirs,—Please allow me to make the following suggestions in reference to your explanation of "Vermin in Southern Pine," given in your No. 542:—

In thirty years' practice I have not only not seen, but never have heard of any one finding a *bed-bug* on new yellow-pine lumber.

There is a *flying bug*, called *wood chintz* (orthography uncertain), generally green, about the size of a finger-nail, emitting a smell similar to that of the bed-bug. But it is altogether a rustic animal, and if it be sometimes found in lumber, the isolated specimens so rapidly disappear as never to my knowledge to have attracted attention, any more than any other kind of insect accidentally caught in a hiding-place.

If real bed-bugs are found in lumber arriving in Boston, I suggest that they may be deadheads from *ship-board*, and that Southern pine reaching Detroit may be reasonably expected to be free from them.

Respectfully, Jas. Freret, *Architect.*

MASTER-BUILDERS' ASSOCIATIONS.

Boston, Mass., May 18, 1886.

To the Editors of the American Architect:—

Dear Sirs, — Will it be possible for you to ask through your columns for information which will enable you to prepare a list of all master builders' associations throughout the country.

Yours truly, Wm. H. Sayward,
Secretary, M. B. A.

NOTES AND CLIPPINGS

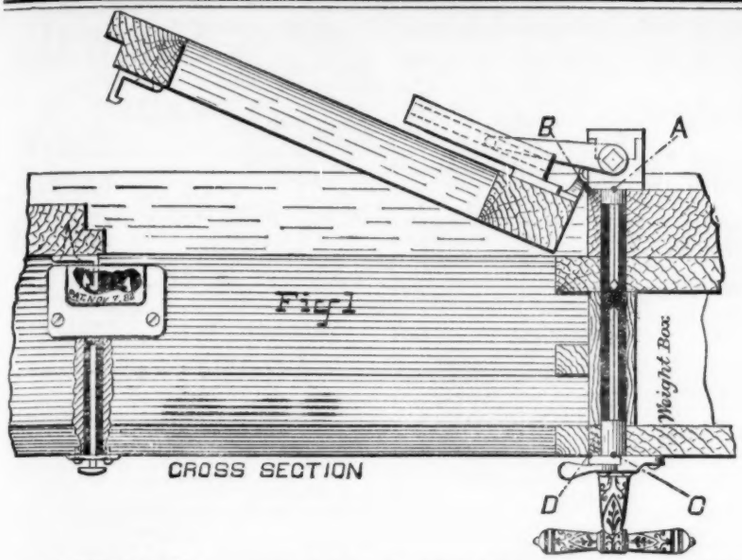
The Frelinghuysen Monument.—A monument of white granite has been placed over the remains of the late Secretary of State Frelinghuysen in Mount Pleasant Cemetery, Newark. It is an obelisk 40 feet high. The lower base is 9 feet square, surmounted by three more bases, in the form of steps. The inscription stone bears an inscription giving the date of the death and birth of the Secretary, and announcing that from 1861 to 1867 he was Attorney-General of New Jersey, United States senator from 1867 to 1869 and from 1871 to 1877, and Secretary of State of the United States from 1881 to 1885.

French Masonry.—The walls are generally built solid, and the method of working and fixing is different from that followed in England. The masons are divided into two classes: first, those that take the rough block as it comes from the quarry, two men generally working together sawing and roughing out, and making beds and joints. The principal tools used are the axe and a kind of drag, formed out of a piece of wood about 8 inches by 3 inches, with six pieces of saw-plate inserted. The prepared stones are taken by laborers to the lift, which is in most cases a square, fixed scaffold with patent crab at bottom, which can be worked by hand or steam power. These scaffolds are fixed at the commencement of building to the intended height, and are built of timber from 8 to 10 inches square, braced with bolts and dogs. The stones are drawn up to the height required, and are then rolled from the scaffold to the wall, and placed in by means of bars, no other appliances being used. This is certainly no improvement on the English system of fixing. The beds and joints are rough and large, varying from ½ inch to ¾ inch. In fixing and working the men do not regard the position of beds and joints. These often come close to the nose of architraves in the centre of pilasters and close to breaks. After the wall is built they start from the top of the structure and work down. The masons who do this part seem to be very good workmen, finishing their work quite as well as English masons. Their tools are similar, excepting that they use planes which are formed to suit any kind of moulding. These tools would not answer for English soft stones, which are more subject to veins and bars.— *W. Pyle.*

A new Painting found at Pompeii.—Mr. Eustace Neville Rolfe, in a letter to the *Times*, dated Naples, August 23, says: "An important painting has been found at Pompeii, and was recently placed in the Naples Museum among the Pompeian frescos. It represents the "Judgment of Solomon," and is the first picture on a sacred subject, the first fragment either of Judaism or Christianity, that has been discovered in the buried cities. The picture is 5 feet 6 inches long, and 19 inches in height, and is surrounded by a black line about 1 inch in width. The scene is laid upon a terrace in front of a house adorned with creeping plants, and shaded with a white awning. On a dais (represented as being about 4 feet high) sits the king, holding a sceptre, and robed in white. On each side of him sits a councillor, and behind them six soldiers under arms. The king is represented as leaning over the front of the dais towards a woman in a green robe, who kneels before him with dishevelled hair and outstretched hands. In the centre of the court is a three-legged table, like a butcher's block, upon which lies an infant, who is held in a recumbent position, in spite of his struggles, by a woman wearing a turban. A soldier in armor, and wearing a helmet with a long red plume, holds the legs of the infant, and is about to cleave it in two with his falchion. A group of spectators completes the picture, which contains in all 19 figures. The drawing is poor, but the colors are particularly bright, and the preservation is excellent. As a work of art, it is below the average Pompeian standard, but it is full of spirit, and drawn with great freedom. The bodies of the figures are dwarfed, and their heads (out of all proportion) large, which gives color to the assertion that it was intended for a caricature directed against the Jews and their religion. This may be so, but my own impression is that the artist was anxious to develop the facial expression, and, to do this, exaggerated the heads. There is nothing of caricature about it in other respects."

TRADE SURVEYS

Trade developments are both encouraging and disappointing according to the standpoint from which they are viewed. The volume of business, according to all the sources of information available, is increasing week by week. Clearing-house exchanges make a favorable showing though there is room for improvement. The accidental exportation of gold possesses no significance. The volume of money seeking investment continues large. A few moderate railway loans have been effected, and building will begin in earnest on four or five enterprises early in July. The trunk-lines between New York and Chicago will lay quite an additional mileage during the third quarter of the year, with the view of making their territory more productive of paying traffic. The change of gauge on the 12,000 miles of Southern roads marks an era in railway development. Quite a number of small enterprises are projected in the Southern States, as in the North, for the building of short lines, particularly in Georgia, Alabama and Florida. The more intimate connections between the Southern railroad systems on both sides of the Mississippi will engage the early and earnest attention of railroad capital. Careful authorities base a great deal of favorable prediction on promising railroad enterprise. Railway material is being ordered with freedom. The locomotive builders have much more work than early in the spring, and the assurance of plenty. A great deal of car work and repairing work generally is creating additional demand for labor. Steel-rail mills have more orders on their books than for years. The bridge-builders are busier than ever, but have very little business ahead, builders preferring to order material as wanted. The wrought and cast iron pipe makers have more business than they can conveniently handle. The puddlers and other skilled mill labor will demand a ten per cent advance west of the mountains, and a seven per cent advance east. The blast-furnace interests are beginning to question whether they are not crowding too much iron on to the market, and the bare possibility of it is checking demand for forward delivery. Prices are firm throughout the iron trade. Hardware manufacturers are busy, but prices have been cut lately. Tool and implement makers are quite busy in the Western States, and advices as late as the early part of this week showed a steady improvement in orders for agricultural implements. Wood-working machinery is active, but competition has about destroyed margins on standard goods. There is, in short, an enormous consumption and a very graded production. Manufacturers in all avenues of production have been warned against over-production. The custom is growing now of ascertaining, approximately, at least, the consumptive requirements in each branch. Great care is taken to get at the facts. This feature of business is a guaranty against wild production. Production is being intelligently organized and controlled, and coöperation is readily assented to, so that competition in the long run is being placed under control. The labor question is more settled. Employers while organizing quietly are accepting arbitration and acting by its desires. The spring strikes have seemed to show employers where they stand. The urgent need of some sort of federation and the necessity of obedience to some higher will than the individual will of each. This good work will be pushed to its logical conclusion. The bituminous strike is over. Anthracite is weakening. Production is ample, and demand is not urgent. The mid-summer season is not far off. Building activity is surprising, considering the intimidations thrown in its way. Low prices for material prevail everywhere. The nine-hour agitation has not produced serious results, and the eight-hour movement is practically a failure. Organized labor is re-organizing itself and endeavoring to place itself in accord with the spirit of the age. Strikes and boycotts are not to be encouraged or in fact tolerated except as a measure of self-defence in extreme cases. Labor means this. Congress has done very little harm and will adjourn without laying rough hands upon the industrial interests. The country is working out of old into new conditions, and it is too soon for hap-hazard legislation to attempt to create harmony between the half-completed developments. The general trade movement is fair. The trunk-line managers keep faith. Western roads also manage to maintain the outward semblance of peace. The iron, lumber, petroleum and other great interests are troubled only with the abundance of crude products. In spite of low prices much machinery is going up, and capacity of all kinds is increased. This observation applies to textile and iron interests particularly. Engines, boilers, machinery of all kinds, tools, and appliances are being produced with an activity and energy which forbids predictions of depression in trade and industry.



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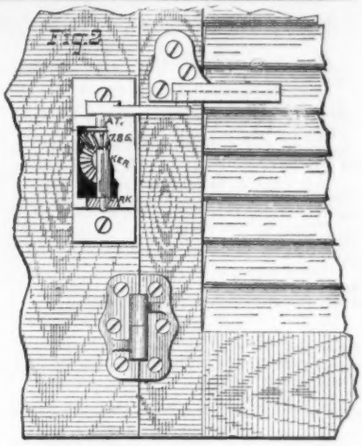

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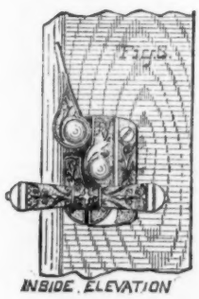

INSIDE ELEVATION

THE UNIVERSAL SHUTTER-WORKER,

MANUFACTURED BY THE

DUDLEY SHUTTER-WORKER CO.,

Office: 105 and 106 Temple Court, New York.

FACTORY: 77 and 79 CLAY STREET, NEWARK, N. J.

TESTIMONIALS FROM LEADING ARCHITECTS:

133 CLARK ST., CHICAGO, ILL., April, 1886.

In answer to yours of the 8th I take pleasure in saying that the Shutter-Worker put on my house, 4822 Lake Avenue, gives perfect satisfaction, and we recommend the same for all outside blinds.

Yours truly, W. H. DRAKE.

NEW YORK, April 8, 1886.

Dear Sirs: The "Universal Shutter-Workers" put on by you work perfectly and are one of the best and most convenient arrangements ever devised for the purpose. I shall consider them an indispensable attachment to the shutters of every house. Yours, GEO. W. DA CUNHA.

---

31 BLACKSTONE BUILDING, CLEVELAND, O., April 10, 1886.

Dear Sirs: I regard the "Universal Shutter-Worker" as a great convenience, and have heard no complaints from you rpresent form.

Respectfully, CLARENCE O. AREY.

---

55 METROPOLITAN BLOCK, CHICAGO, ILL., April 10, 1886.

Dear Sirs: I cheerfully acknowledge that I have used your "Universal Shutter-Worker" on my building, and that same have given general satisfaction and that I will specify same in my specifications.

A. DRUIDING.

---

346 AND 348 BROADWAY, NEW YORK, Feb. 16, 1886.

Gentlemen: If you will kindly have your representative call at my office some day between one and two o'clock, I will give him an order for some Shutter-Workers. The one which you have put on one of my rear windows, 161 E. 91st street, works entirely satisfactorily; in fact, the party from whom I have the above order for you saw it at my house. As formerly stated, I would also like to have the Shutter-Workers to the balance of the windows of my residence.

Very truly yours, ALFRED ZUCKER.

ROOM 22, 89 EUCLID AVE., CLEVELAND, O. April 9, 1886.

Dear Sirs: Yours of the 8th received. Have tried your "Universal Shutter Worker" for several months and am satisfied that they fully perform all that is claimed for them. Have had no trouble and found that they worked easily at any time. Respectfully, I. J. LEHMAN.

---

115 DEARBORN ST., CHICAGO, ILL., April 10, 1886.

Dear Sirs: Your note at hand, and, in reply, will say that, as far as I have used your improved Shutter-Worker, am well pleased and satisfied that it is all you claim for it. I have been specifying it for country houses and will be able to give you the opinion of those for whom I am putting them on before long. I am confident myself, however, they will give entire satisfaction, and are certainly a great convenience.

Yours most respectfully, CLARENCE L. STILES.

---

15 HARNEY ST., OMAHA, NEB., April 8, 1886.

Dear Sirs: I have much pleasure in adding my testimony to the merits of the "New Improved Dudley Shutter-Worker." I have had them in use now some months in my own residence and have found them to be more than represented, and have given every satisfaction. I have no hesitation in using them on all occasions.

Yours very truly, SIDNEY SMITH.

---

40 BLACKSTONE BUILDING, CLEVELAND, O. April 9, 1886.

My Dear Sirs: Your favor of yesterday just received. I am pleased to say that the "Universal Shutter-Worker" in use at my house is very satisfactory. I believe it to be the best device of the kind in the market. We have specified them wherever we have had outside blinds on our work this season. Very truly yours, F. S. BARNUM.

---

116 AND 118 DEARBORN ST., CHICAGO, ILL., April 10, 1886.

Dear Sirs: In reply to yours of the 8th inst. I beg to say that we have a favorable impression of your Shutter-Worker and can highly recommend it.

ADDISON & FIEDLER.

2281 THIRD AVE., NEW YORK, April 24, 1886.

Dear Sirs: With reference to the "Universal Shutter-Worker" adjusted recently to blinds of my residence, I would say I have tested them in fierce storms as well as sunshine, and find them a great convenience and a wonderful improvement on the old method of reaching three-quarters of your body out of the window to unfasten a stubborn catch, exposed to a hot sun, blinding dust, freezing weather or a tempestuous storm. We find the fixtures very serviceable, too, in adjusting and fastening the blinds at any angle to keep sun out of rooms. I shall take occasion to specify them for buildings. They are very satisfactory.

Yours truly, JAS. S. WIGHTMAN.

---

89 EUCLID AVE., CLEVELAND, O., April 9, 1886.

Dear Sirs: After a thorough trial of your Shutter-Worker on my own residence I would most cheerfully say that it "does the business right up to the handle," and I shall not hesitate to recommend it to owners of both old and new buildings as worthy of all that is claimed for it.

Yours respectfully, CHAS. E. COLE.

---

149 BROADWAY, NEW YORK, April 9, 1886.

Dear Sirs: The Shutter-Worker you put in my house works well — so well that we shall specify it where practicable. * * * *

Yours, &c., J. A. WRIGHT.

OMAHA, NEB., April 16, 1886.

Dear Sirs: After first putting the "Universal Shutter-Worker" under a severe test on a large bay window in my own residence, where the blinds are exposed to the high winds of this section, I find the "Universal Shutter-Worker" fulfills all requirements of strength and adaptability. During the last winter for 36 continuous days the thermometer ranged from zero to 34 below. All through this severe weather we appreciated highly the convenience of opening and closing our blinds without raising the sash — in fact, most of the time the sashes were frozen fast, so that we could not raise them, and we were compelled to go outside to open and close those not having the Universal attachment. I shall specify them in all cases.

Resp'y yours, C. F. DRISCOLL.

---

116 EUCLID AVE., CLEVELAND, O., May 15, 1886.

Dear Sirs: The Dudley Shutter-Worker gives me unbound satisfaction. I am much pleased with it and have shown it to my clients. * * * *

I see no reason why the Dudley Shutter-Worker should not be used with all outside blinds on good frame houses.

Yours truly, GEO. F. HAMMOND.

---

31 PINE ST., NEW YORK, April 9, 1886.

Dear Sirs: Yours of yesterday, requesting me to give you my opinion of the working of the "Universal Shutter-Worker" furnished by your company, is at hand. In reply I have to say that it has worked to my entire satisfaction, and although some of the parts composing the interior seemed to me to be frail, yet they have with stood the pressure of the wind on quite large outside blinds without failing to work in some of the late severe storms when I have had occasion to use them. They are a great convenience, and I think it quite certain the public will think so when they get in more general use. Very truly yours, &c., O. P. HATFIELD.

SAMUEL W. WHITTEMORE, P. O. BOX 175,
BRICK CHURCH, N. J., May 20, 1886

THE DUDLEY SHUTTER-WORKER CO., TEMPLE COURT, N. Y.

Gents: I am very well pleased with your device applied to my house. It appears to be strong in all its parts, and the simple fact that outside blinds can be regulated without raising sash is a source of great comfort, and I shall not hesitate to recommend it to my clients. Your present fixture is a great improvement on the former.

Yours truly, S. W. WHITTEMORE.

The American Architect and Building News.

PUBLISHED EVERY SATURDAY BY

TICKNOR & COMPANY

211 Tremont St., Boston, Mass.,

For The American Architect and Building News Co.

[No change in editorial management.]

Regular edition (with Mid-Week Edition), $6.00 per year; six months, $3.50.
Gelatine edition (with Mid-Week Edition), $7.00 per year; six months, $4.00.
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New Advertisements.

J. & R. LAMB (New York, N. Y.), Art Metal-Work. Page 2, Supplement.
DUDLEY SHUTTER WORKER CO. (New York, N. Y.), Shutter-Worker. Page xi.
E. ASPINALL (New York, N. Y.), Water-Closets. Page xiii.
H. N. F. MARSHALL (Northfield, Mass.), Building Stone. Page xviii.

PERSPECTIVE DRAWING.

The *American Architect* Drawing-Office will undertake the preparation of perspective drawings in line or color from scale drawings, or will render drawings already in outline. Address the editors.

WANTED.

DRAUGHTSMEN. — Wanted, at once, one or two draughtsmen, up in design and detail. Address J. A. Dempwolf, York, Pa.

WANTED.

AGENCIES. — By Chicago party, representing an Eastern house, who manufacture a building specialty, and calling on architects and builders in Chicago and Milwaukee, one other line to handle in connection with present line. Only first-class articles will be considered. A No. 1 reference. Address G. S. Arnold, Room 77, 93 Adams St., Chicago. 545

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[*Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.*]

FACTORIES.

Caro, Mich. — J. N. Mertz has commenced building a two-st'y brick carriage-factory on Burnside St.

Madison, Dak. — N. B. Smith, of Ortonville, will build a $20,000 flour mill this season at this place.

HOTELS.

Aurora, Neb. — Mr. Tuttle will build a brick hotel.

Carey, O. — A hotel is being built, at a cost of $19,000; owner, H. Fetters; architect, Mr. Hewett, Tiffiin; contractors, Brown & McGown, Akron.

Dodge City, Kans. — A new $25,000 hotel is shortly to be built here.

Topeka, Kans. — Mr. Searight & Son, formerly of Tipton, in this county, will soon commence building a hotel, with a stable in connection.

LABOR.

Pittsburgh, Pa. — The stone-masons' strike was compromised at a conference of contractors and employés, and work was resumed May 26.

PUBLIC BUILDINGS.

Washington, Kans., is to have a new $30,000 court-house. The old building is to be moved and occupied while building the new one.

SCHOOL-HOUSES.

Fairmont, Minn. — A school-house will be built here. J. H. Anderson, of Spring Valley, holds the contract, cost, $15,000.

Iowa Falls, Ia., will build a school-house, cost, $10,000.

New York, N. Y. — Plans have been filed in the Bureau of Buildings by the Church Extension Society for a two-st'y Sunday-school building to be built on the s w cor. of Seventy-second St. and Second Ave., cost, $20,000. Plans have also been filed for a school and workshop at Nos. 195 and 195½ Division St. by the Hebrew Free School Association. The building is to be four stories high exclusive of the basement. The cost is not estimated.

STABLES.

Haverhill, Mass. — Stable, Henry P. Tyler; mason-work, David Webster; carpenter work, Leavitt & Taylor.

New York, N. Y. — *Fifty-third St.*, n s, 100′ w of Eighth Ave., three-st'y brick stable, tin roof; cost, $10,000; owner, Henry B. Wright, 30 W. Sixty-fifth St; architect, Berger & Baylies, 52 Bible House.

MISCELLANEOUS.

Montezuma, Ia. — The G. A. R. will build a memorial hall.

Minniscoh, Kans. — Ground has been broken for two new two-st'y brick blocks, on the vacant lots north of Burket's drug store.

PROPOSALS.

WATER-CLOSET APPARATUS.
[At Washington, D. C.]

Office of Supervising Architect,
Treasury Department,
Washington, D. C., May 28, 1886.

Sealed proposals will be received at this office **until 2 P. M., on the 30th day of June, 1886,** for furnishing and delivering, properly boxed, free, on board cars, the water-closet apparatus that may be required for public buildings during the next fiscal year ending June 30, 1887, in accordance with specification, copies of which and any additional information may be had on application at this office.

Bids must be accompanied by a certified check for $300.

M. E. BELL,
546 Supervising Architect.

WATER-WORKS.
[At Greensburg, Ind.]

Sealed proposals will be received by the Common Council of the City of Greensburg, Decatur County, Ind., at the office of the Mayor in said city **until 12 o'clock M., of the 17th day of June, 1886,** for constructing Greensburg Water-Works under a franchise to be granted by the Council of said city. Said works to be constructed, controlled, operated and owned by the party receiving said franchise, subject to the terms of said bid, and the requirements and stipulations contained in the water-works ordinance passed by said City Council.

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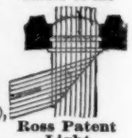

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PROPOSALS.

Copies of general specifications and form of proposals will be furnished by the Water-Works Committee of said Council.

The Council hereby reserve the right to reject any or all bids. JOHN O. MARSHALL, City Clerk.
J. D. Cook, Consulting Engineer. 546*

CITY-HALL.
[At Richmond, Va.]

City Engineer's Office,
Richmond, Va., May 3, 1886.

Sealed proposals will be received at this office **till June 10th next, at 12 o'clock, M.,** for building a city-hall in accordance with plans and specifications on file at the city engineer's and architects' offices.

Bids will be received for Virginia and other granites.

The "Committee on Grounds and Buildings" reserve the right to reject any or all bids.

For information apply at the city engineer's or the architects' office. WAIT & CUTTER,
7 Exchange Pl., Boston, Mass. Architects.
545*

STEAM-HEATING, ETC.
[At Davids Island, N. Y.]

Depot Quartermaster's Office,
Davids Island, N. Y. H., May 26, 1886.

Sealed proposals, in triplicate, subject to the usual conditions, will be received at this office **until 12 M., June 25, 1886,** at which time and place they will be opened in presence of bidders, for providing a steam heating and cooking apparatus for the new mess hall and kitchen at Davids Island, according to plans and specifications to be seen at this office, or at the office of W. J. Baldwin, Consulting Engineer, 96 Fulton St., New York City.

Competition will be confined to parties engaged in the manufacture of or dealers in steam heating or steam cooking apparatus.

Blanks and instructions to bidders furnished on application. Envelopes containing proposals to be marked "Proposals for Steam Heating and Cooking Apparatus," and addressed to the undersigned. Informal bids will not be considered.

The right to reject any or all proposals is reserved by the Government. GEO. H. COOK,
Capt. and Asst. Quartermaster, U. S. Army,
547 Depot Quartermaster.

PROPOSALS.

CRIB. [At Binghamton, N Y.]

OFFICE OF WATER COMMISSIONERS,
CITY OF BINGHAMTON, N. Y., May 19, 1886.

Sealed proposals for the construction of a crib in the middle of the Susquehanna River, opposite the water-works pumping station, and the laying of a thirty-inch cast-iron pipe connecting such crib with the wells of said water works, will be received by this Board **up to Friday, June 12, 1886, at 2 o'clock,** P. M.

Such work is to be done according to drawings which may be seen at this office, and printed specifications which can be obtained by addressing the undersigned.

The Water Commissioners reserve the right to reject any or all bids.

By order of the Board. HORACE E. ALLEN,
545* Secretary.

JAIL AND JAILOR'S RESIDENCE. [At Topeka, Kans.]

Sealed proposals will be received at the County Clerk's office, at Topeka, Kans., **until 12 o'clock,** M., **June 11, 1886,** for the erection of a jail and jailor's residence, to be built on lots 140, 142 and 144 Van Buren St., in the city of Topeka, Kans.

Said building to be constructed according to plans and specifications prepared by Architects Hopkins & Holland, and now on file in the County Clerk's office, and in the office of the above-named architects.

Bids will be received as follows: —

1. For the entire building complete, including material of all kinds.
2. For the entire masonwork, including the setting of all cut-stone.
3. For the furnishing of all cut-stone on the ground ready to set.
4. For the carpenterwork, plastering, painting, slating, sheet metallic work, and all ironwork except jail work.
5. For the steel and iron work for the jail, specified under that head.

All proposals on the first, second, third and fourth items must be accompanied by a good and sufficient bond to the amount of fifty per cent of the amount of the bid, conditioned that the bidder will enter into a contract and give satisfactory bond if awarded the contract.

All proposals on the fifth item must be accompanied with a certified check of $5,000, made payable to the County Treasurer, conditioned as above.

All bonds must be certified to by the Clerk of the Court of the county in which the bondsmen reside, that the bond is good and sufficient beyond all doubt.

Payment on the aforesaid work will be made in county scrip, upon monthly estimates made by the architects, on or about the first of each month, ninety per cent of which will be paid at the time of making such estimates, and the remaining ten per cent when the whole of said work is completed and accepted. None but the final estimates will be considered as an acceptance of the work.

Said building to be completed on or about January 1, 1887.

Proposals must be sealed and indorsed with a statement whether for the whole or a particular part thereof.

The Commissioners reserve the right to reject any or all bids.

By order Board County Commissioners, Shawnee County, Kans., May 10, 1886.

Attest: D. N. BURDGE,
545* County Clerk.

SIDEWALK AND RAILING. [At Allentown, Pa.]

COMMISSIONER'S OFFICE, LEHIGH CO.,
ALLENTOWN, May 14, 1886.

Sealed proposals are hereby invited for the construction of a sidewalk and iron railing along the north side of the Hamilton Street Bridge across the Jordan meadow in the city of Allentown, Lehigh County, Pa., as follows: —

1. For furnishing all the labor and material, and complete the entire structure from the foundation up to and including the pavement and foundation, also including iron guard railings on both sides of the sidewalk.

2. For constructing an iron sidewalk and iron-guard railings, deliver and erect the same complete in place, and prepared to put thereon either a concrete or asphaltum pavement. The county to furnish all the masonry necessary from and including the foundations to and including the arching of the sidewalk, should any arching be necessary.

Each proposal must be accompanied by a draft and specifications, showing the design of the structure proposed to be furnished by the contractor, and specifying in detail the entire work and material to be used for the same: also what amount of vertical pressure in pounds the structure will bear to the square foot. The bridge along which the sidewalk is to be erected is a stone arch structure, with seventeen arches about 30′ span each. The sidewalk will be 586′ in length, 15′ wide in the clear, with an inclination of one-half inch to one foot toward the roadway, and will have a rise from east to west of 3′ and two-tenths in 100′ equal to an inclination of one degree and fifty minutes, and its elevation above the meadows and Jordan Creek will be from 20′ to 40′.

The sidewalk must be made in the most substantial manner, well secured against lateral pressure towards the north, and satisfactory to the County Commissioners and their engineer.

The said Commissioners reserve the right to reject any or all bids.

Proposals will be received at the office of the County Commissioners, City of Allentown, **until 10 o'clock,** A. M., **June 7, 1886.**

Further particulars may be ascertained upon application to Capt. H. C. Wagner, Commissioners' Clerk, or to the undersigned.

S. D. LEHR, Engineer.

By order of
C. F. HARTZELL,
W. B. MOYER,
W. S. KNAUSS. } Commissioners.
Attest:—H. C. WAGNER. 545

SCHOOL-BUILDING. [At Westchester, N. Y.]

WESTCHESTER, N. Y., May 10, 1886.

Sealed proposals for building a new school in District No. 1, Westchester, Westchester Co., N. Y., will be received by the Board of Education of said District **before June 10, 1886,** at the office of John E. Kerby, architect, 280 Broadway, New York city, at which office plans and specifications can now be seen.

JOHN H. SCREVEN,
Chairman Building Committee and Board of Education. 545*

PUBLIC BUILDINGS. [At Atlanta, Ga.]

OFFICE OF ASSISTANT QUARTERMASTER,
No. 2 PETERS ST., WEST END,
ATLANTA, GA., May 15, 1886.

Sealed proposals in triplicate, subject to the usual conditions, will be received at this office **until 11 o'clock,** A. M., **June 14, 1886,** central time, at which time and place they will be opened in the presence of bidders, for the construction on the United States military reservation, near Atlanta, Ga., of the following described public buildings, viz.: —

One double set company barracks.
One triple set company barracks.
One commissary storehouse.
One bakehouse and two ovens.

Proposals will be received for each or all of the buildings complete, the price of each to be stated separately; or, for the various classes of work, viz.: Excavating and grading, foundations, brickwork, etc., the price of each class to be stated separately for each building.

Copies of plans and specifications, with full instructions to bidders, will be furnished on application to this office.

The work must be commenced by the 1st day of July, 1886, and completed by or before the 30th day of June, 1887; provided the contract is awarded as a whole, otherwise within a reasonable time after the award of the contract.

Each proposal must be accompanied by a guaranty equal to ten per cent of the amount of the bid, executed in accordance with the forms furnished by this office. Preference given to articles of domestic production and manufacture, conditions of price and quality being equal, and such preference given to articles of American production and manufacture produced on the Pacific coast to the extent of the consumption by the public service there.

The Government reserves the right to reject any or all bids or parts thereof.

Blank proposals and instructions as to bidding, terms of contract, payment, etc., will be furnished on application to this office.

Envelopes containing proposals must be marked "Proposals for construction near Atlanta, Ga., and addressed to the undersigned.

J. W. JACOBS,
Captain and Assistant Quartermaster, and A. C. S., U. S. A.
546

COURT-HOUSE. [At Howard, Kans.]

Sealed proposals will be received by J. S. Johnson, County Clerk of Elk County, Kans., at the clerk's office in the City of Howard, **up to 3 o'clock,** P. M., **June 7, 1886,** for the erection and completion of a court-house and jail building and jailor's residence on the public square in the city of Howard, Elk County, Kans., according to plans and specifications prepared for same by W. R. Parsons & Son, architects, Topeka, Kans.

Plans and specifications may be seen on file in the County Clerk's office of Elk County, Kans., or in the office of architects, 227 Kansas Ave., Topeka, Kans.

Each bid must be accompanied by a certified check to the amount of $500, or a good and sufficient bond to the amount of $5,000, that the bidder will at once enter into contract for the performance of the work, and give bond to twice the amount of the contract with good and sufficient sureties for the faithful performance of the same.

Contract will call for the completion of work on or before January 1, 1887.

Bids to be addressed to R. W. M. Rowe, Chairman Board of County Commissioners, and endorsed proposals for Elk County court-house and jail building and jailor's residence.

The Board of County Commissioners reserve the right to reject any and all bids.

By order of the Board of County Commissioners.
545 J. S. JOHNSON, County Clerk.

CITY-HALL. [At Vincennes, Ind.]

Sealed proposals for the erection of a new city-hall at Vincennes, Ind., will be received at the office of the City Clerk at Vincennes, Ind., **up to 7** P. M., **June 14, 1886.**

Drawings and specifications for the said building will be on file on and after **June 1, 1886,** in the office of C. M. Allen, Jr., City Clerk, Vincennes, Ind., and in the office of H. Woltors, architect, Louisville, Ky.

The right is reserved to reject any and all bids.

A good and sufficient bond or a certified check must accompany each bid.

By order of the Common Council.
C. M. ALLEN, JR.,
545* City Clerk.

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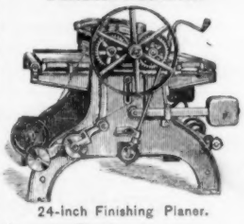
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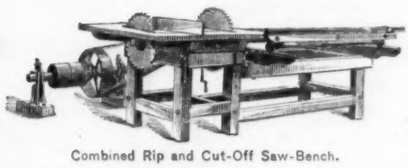
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PROPOSALS.

PUBLIC LIBRARY. [At Boston, Mass.]

Sealed proposals will be received at the office of the Trustees of the Public Library of the City of Boston, No. 666 Washington St., Boston, Mass., **until 12 o'clock,** M., **June 15, 1886,** for the erection of a building for the Public Library of the City of Boston, on the land bounded by Boylston, Dartmouth, Newton and Clarendon Streets, in the Back Bay District of said city.

Plans, specifications, and forms of proposals may be obtained at the office of the Trustees, No. 666 Washington St., Boston, Mass., on and after June 1, 1886.

Each proposal must be accompanied by a certified check for $5,000, payable to the order of the Trustees of the Public Library of the City of Boston, which will be forfeited to the Trustees if the bidder to whom the contract is awarded shall fail to enter into the contract and give the bonds required within ten days after the contract is awarded to him.

The Trustees reserve the right to reject any or all proposals.

By order of the Trustees.
ARTHUR GILMAN, Secretary.
545

SCHOOL-HOUSE. [At Lawrence, Mass.]

Sealed proposals will be received by the Committee on Public Buildings of the City of Lawrence, Mass., **up to 12 o'clock,** M., **June 15, 1886,** for the erection of a school-house on Haverhill Street, in said city.

Plans and specifications may be seen at the office of the City Engineer, Lawrence, Mass., on and after June 1, 1886.

Each proposal must be accompanied by a certified check for $1,000, payable to the order of the City Treasurer, which will be forfeited to the city if the bidder to whom the contract is awarded shall fail to enter into the contract and give the bonds required within ten days after the contract is awarded to him.

The Committee reserve the right to reject any or all proposals.

By order of the Committee on Public Buildings.
JOHN J. MAHONEY, Clerk.
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By order of the Committee on Public Buildings.
JOHN J. MAHONEY, Clerk.
545

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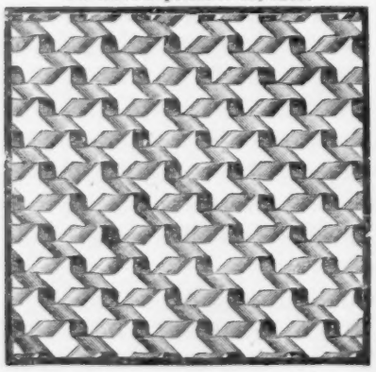

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Gilbertson's Old Method Roofing Plates were accepted for Roof of White House at Washington.

The following letter, just received by us, unsolicited on our part, we publish by permission:—

Alliance, Ohio, April 8, 1886.

Messrs. Merchant & Co., Philadelphia, Pa.

Gentlemen,— Since the introduction of the so-called "Re-dipped" Roofing Plates by the different importers, and the claim of each house that their particular brand was the best, we have been unable to decide which brand to buy, as all were nearly the same price, and *all* claimed to be the best We want to use the very best brand, for tin plate is now so cheap that there seems to be no excuse for using inferior plates.

A month or so ago we determined to test for ourselves the leading brands of the *old kind* of Roofing Plates, and we purchased some of the following brands: "GILBERTSON'S OLD METHOD," "Old Style," Penn Old Process and A. L. T. Old Process. We first opened the plates and weighed them, with the following results:—

GILBERTSON'S OLD METHOD,	234 1-2 lbs.
Penn Old Process,	225 1-2 "
A. L. T. Old Process,	218 1-2 "
Taylor's Old Style,	214 "

We then, to the best of our ability, tested the coating, and found the OLD METHOD much more heavily coated than any of the others, Old Style having the least coating. OLD METHOD was the smoothest, free from spots, and with cleaner edges, Old Style coming next.

As to the quality—*i. e.*, ductility, etc.—we could not distinguish any difference, but in every other particular OLD METHOD is better than any of the others named, and we have decided for our use OLD METHOD must have the preference.

We thought may be you would be glad to hear that your OLD METHOD compared so favorably with the other leading brands; hence, this letter.

[Signed] Respectfully, OBY & LOVE.

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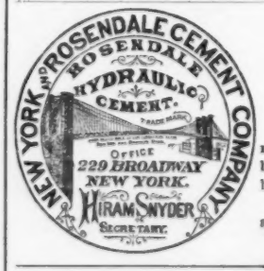

City Engineer's Office, City Hall,

Providence, R. I., March 12, 1886.

Abstract from letter of

SAMUEL M. GRAY, CITY ENGINEER.

During the season of 1885 **the Sewer Department** used **3,152 Barrels** of the **New York and Rosendale Cement.** Of this amount **1,348** barrels were tested for tensile strength, the average of the Season's tests being **165.7** pounds per square inch, twenty-four hours test.

One hundred and forty-five barrels were tested for fineness, the average amount passing through a **2,500** mesh sieve being **92.56** per cent.

Tests for checking were occasionally made but none were discovered.

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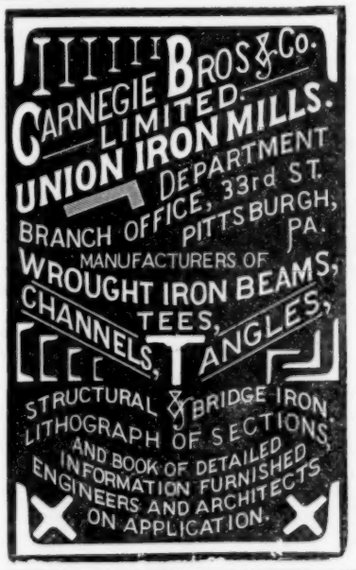

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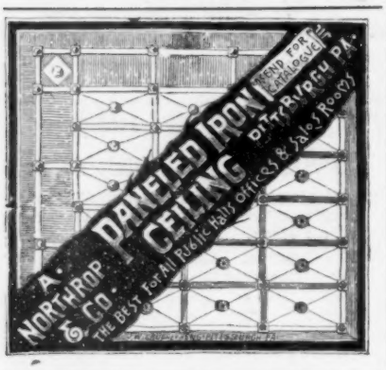

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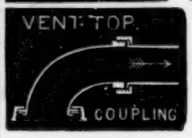

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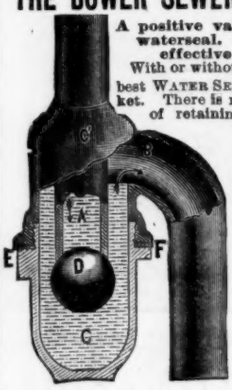

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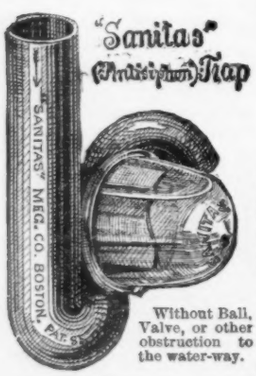

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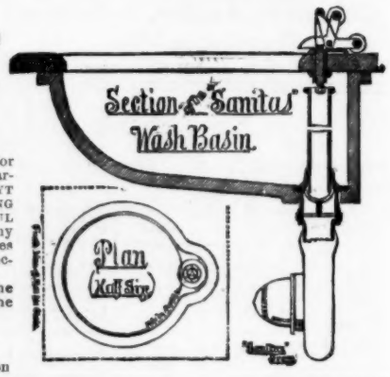

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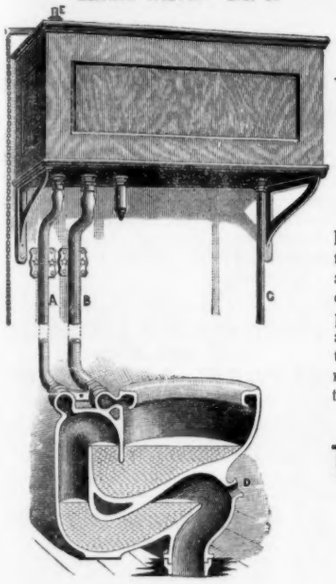

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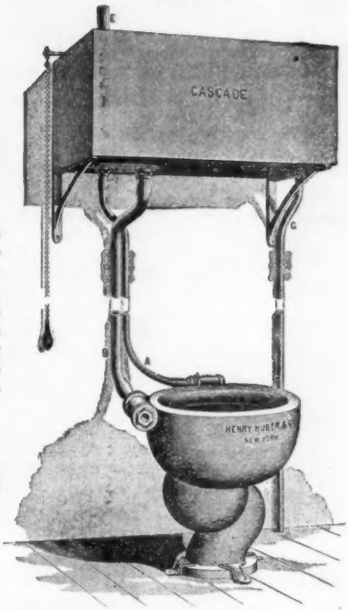

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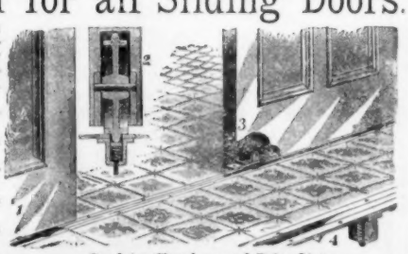

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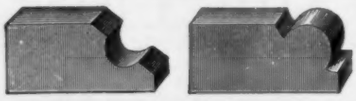

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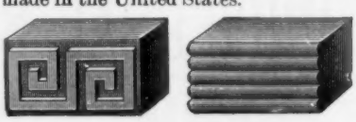

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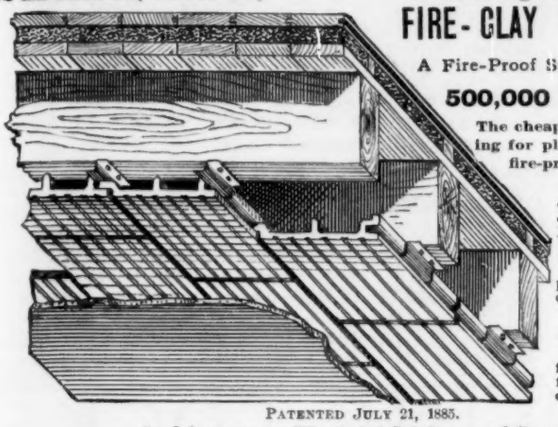

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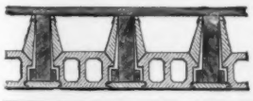

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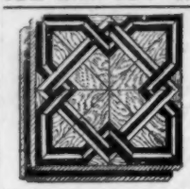

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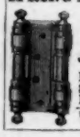

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The American Architect and Building News

ADVERTISERS' TRADE SUPPLEMENT.

No. 48. SATURDAY, JUNE 5, 1886. Volume XIX. No. 545

VENETIAN BLINDS.

The subjoined cut shows partially the inside effect of the new and elegant Venetian blinds, manufactured by the Phillips Venetian Blind Company, whose advertisement appears elsewhere in these columns. They are the latest invention in blinds, and combine several patented improvements which place them far ahead of any blind in the market. Among their points of superiority may be mentioned the elegant finish and great variety of the native woods of which they are made; the simplicity of their construction, great durability, their adaptability to any style of window, new or old, the small amount of space occupied, the non-interference with draperies, the ease with which they can be put up and taken down, the various ways in which they can be manipulated so as to let in as much or as little light or air as desired, the fanciful shapes in which they can be put by simply pulling one or both cords, their free, simple operation, and the indisputable fact that they are the cheapest blind in the market, taking the place of shades, curtains and either outside or inside, hinged or sliding blinds, being, in point of fact, a shade and blind combined. The blind is a Yankee invention which it will pay every house-builder and house-owner in the land to examine, and which has the hearty endorsement of several of the leading architects in the country, and needs only to be seen to be appreciated. Circulars and price-list sent free on application to

PHILLIPS BLIND COMPANY,
Willimantic, Conn.

DYCKERHOFF PORTLAND CEMENT.

It gives us pleasure to call the attention of architects and builders and all those interested in the employment of good Portland cement, to the Dyckerhoff brand, which, according to testimony, appears to excel in those qualities which are of the greatest importance in a Portland cement. The following abstract is from the pamphlet recently issued by Mr. E. Thiele, the representative of Messrs. Dyckerhoff & Sons in this country, showing its points of merit: —

"It is of correct chemical composition, perfectly well burnt and very finely ground. The system of appliances at every stage of its manufacture being perfect, its strength, fineness and other properties are invariably the same.

"The unusual fineness of the Dyckerhoff Portland Cement is a very important advantage. Cement serves the purpose of covering and binding together grains of sand, etc. The finer a cement is ground, the larger will be the quantity of sand which a given quantity of cement can cover and intimately bind together. This explains the fact that the extraordinary and uniform fineness of the Dyckerhoff Portland Cement will permit the addition of twenty-five to fifty per cent more sand than other well-known but generally much coarser brands of Portland cement.

"Its slow setting is another advantage of great importance, as it gives ample time for the proper preparation of the mortar. The hardening proceeds slowly at first but surely, and advancing in age, the material obtains extraordinary and increasing strength, as tests even after two years have shown. Most brands of Portland cement will attain a certain degree of hardness, but this is not the only property required of a good Portland cement. Owing to the imperfection of their composition or manufacture, many cements will not stand the test of time, and are subject to contraction and expansion in volume, to the great injury of the work in which they may have been used.

"The Dyckerhoff Works, however, have succeeded not only in producing the strongest cement known, but one unalterable in volume, not liable to crack, and of a uniform and never-varying quality. It will always produce the most reliable, and, by reason of the greater addition of sand, the most economical, work."

This pamphlet, containing a description and tests of this cement, with full directions for the employment, the preparation and composition of mortar, concrete, artificial stone, and containing also a large number of testimonials of architects and builders in high standing throughout the country, will be forwarded free of charge, on application to

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78 Williams St., New York.

CHURCH BELLS.

"Ring and swing
Bells of joy! on morning's wing
Send the sound of praise abroad;" —

and bear in mind that a good bell or bells in a church tower with rich, musical tone is a joy forever, and to secure such a joy, care should be exercised to obtain a bell possessing all the requisites to make it a joy forever.

Many bells, and many of them represented as first-class, are sadly deficient in many respects, and often cause great expense and trouble to the purchasers before they realize their mistake of selecting a bell because the price is the lowest, without possessing any other satisfactory recommendations.

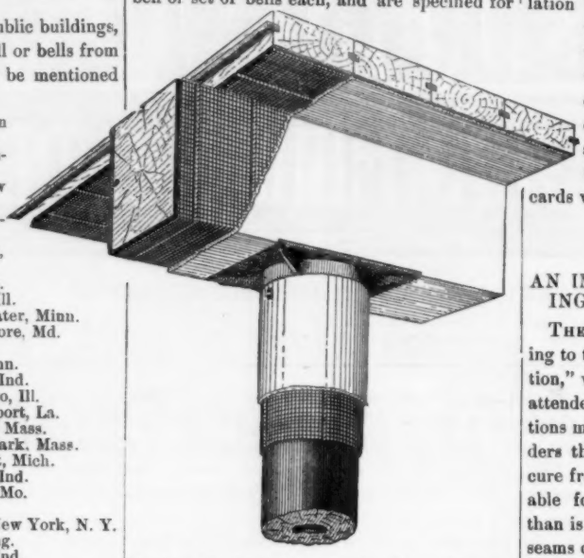
Parties should always investigate as to the merits of the bells they are asked to buy, and after learning which possess the most satisfactory quality of tone, resonance, volume of sound, purity of material, etc., should then purchase that bell, which they will always find

the cheapest because the best. The McShane Bell Foundry, of Baltimore, Maryland, still continues to manufacture bells, peals, and chimes of the highest standard of excellence, and which have always so agreeably surprised and universally satisfied every purchaser in the past, and always supplied at most reasonable price and liberal terms.

Among some of the noted public buildings, churches, etc., which contain bell or bells from this widely-renowned firm, may be mentioned the following, viz.: —

Cathedral of Incarnation, Garden City, N. Y.
St. Paul's P. E. Church, Cheltenham, Penn.
The Cotton Exchange Building, New Orleans, La.
St Joseph's R. C. Cathedral, Columbus, Ohio.
Centenary M. E. Church, Richmond, Va.
Shelby Co. C. House, Sidney, Ohio.
St. Mary's R. C. Church, Canton, Ill.
St. Michael's R. C. Church, Stillwater, Minn.
St. Vincent's R. C. Church, Baltimore, Md.
Fulton Co. C. House, Atlanta, Ga.
Knox Co. C. House, Knoxville, Tenn.
Kosciusko Co. C. House, Warsaw, Ind.
St. Stanislaus R. C. Church, Chicago, Ill.
First Presbyterian Church, Shreveport, La.
Church of Immac. Concil., Lowell, Mass.
Church of M. Prec. Blood, Hyde Park, Mass.
St. Gussipp's R. C. Church, Detroit, Mich.
St. Joseph's R. C. Church, Jasper, Ind.
U. S. Custom House, Kansas City, Mo.
Allen Co. C. House, Lima, Ohio.
Church of Most Holy Redeemer, New York, N. Y.
St. Ann's Church, Birmingham, Eng.
Madison Co. C. House, Anderson, Ind.
St. Mary's Church, Buffalo, N. Y.
St. Michael's Church, "
Sacred Heart Church, "
Tippecanoe Co. C. House, Ind.
Cathedral Immac. Concep., St. John, N. B., Can.
Church of Holy Name, Sheboygan, Wis.
Fayette Co. C. House, Washington, C. H., Ohio.
Cath. of H. Guard. Angels, St. Cloud, Minn.
Benedictine Abbey, St. Meinrad's, Ind.
Cath. Immac. Conception, Leavenworth, Kan.
South Cong'l Church, Bridgeport, Conn.
St. John's Ev. Luth. Church, Louisville, Ky.
St. Francis Cap. Church, Milwaukee, Wis.
Trinity P. E. Cathedral, Omaha, Neb.
St. James R. C. Church, Baltimore, Md.
Carroll Co. C. House, Ohio.
St. Peter's Church, Lockport, N. Y.
Trinity P. E. Church, Cornwall, Ont.
Marion Co. C. House, Ohio.
St. Basil's Church, Brantford, Ont.
St. Michael's Church, Newark, N. J.
Church of Annunciation, Leadville, Colo.
Christ Church, Vicksburg, Miss.

These are only a small part of the many churches and buildings which contain a large bell or set of bells each, and are specified for



the benefit of architects and others who may wish to learn of the merits of the McShane bells, peals, and chimes. Messrs. McShane & Co. will be pleased to supply a copy of their Bell Catalogue free, containing much valuable information concerning their bells, to any architect applying for same who may be desirous of knowing more about the firm and their truly excellent bells, etc. The firm employs in its various departments an aggregate of nearly eight hundred workmen; the works covering a space of about five acres, and it can be truthfully said that, were all the bells that this firm have supplied since the beginning of their business placed in a straight line at equal distances apart, and then all rung at one time, they would reach all around the earth, and produce one continuous tintinnabulation that would be heard all around the world over a track ten to sixteen miles wide. Architects planning buildings with towers intended to contain a bell or bells, would do well to secure a copy of this firm's catalogue, which they will send free upon application. Architects will please send one of their business cards with application.

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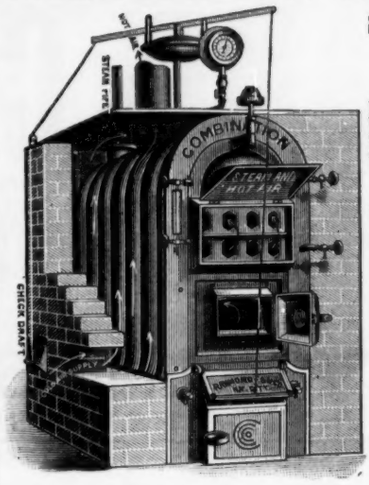

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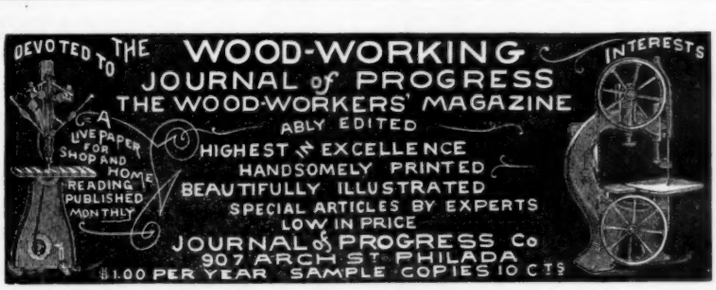

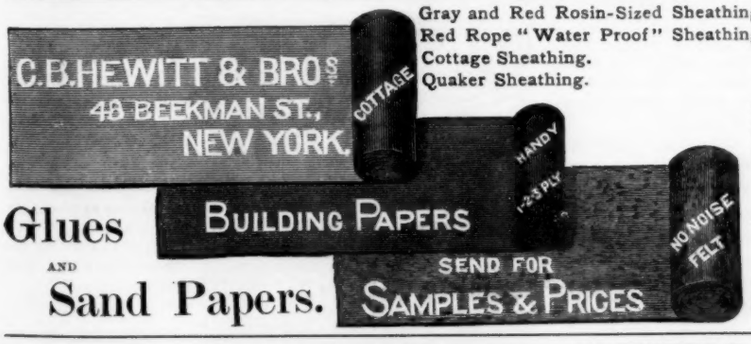

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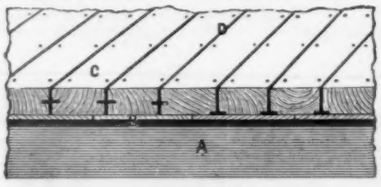

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